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EDITORIAL.

THE ORIGINAL OF SHERLOCK HOLMES.

With the passing of years the interest that was aroused by the Sherlock Holmes series of books upon their first appearance has somewhat abated; but, even though they are not read to-day with the eagerness that marked their advent into the book world, the central figure is quite unforgettable, if only on account of the extraordinary shrewdness with which he manages to dissipate all mysteries. Perhaps in our admiration of the characteristics of this bit of fictional portraiture we laud the author too highly, forgetful all along that he had a model such as is granted to few men, and that about all he did was to throw the magic of his literary art around a living person who was ever a source of inspiration . But acumen on the part of a writer should not go for nothing, for, if this is lacking, many things around him which might yield inspirational ideas are thoroughly overlooked, and the result is not the creation of a flesh-and-blood character, but something that is laughably unreal. Now Conan Doyle, whatever may be the judgment of his literary talent, has the bent of mind that makes much of detail; and whether or not this was inborn or acquired, one thing is certain—he developed the faculty for observing the minutiæ of life during those student days when the almost uncanny power of the teacher and physician, who was afterwards to be the prototype of his most famous characterization,enthralled him in the matter of making a correct diagnosis from some minor deviation from the normal standard of health, as shown in one's gait, one's complexion, one's manner of speech. And now that the prototype has passed away, it would be an error of judgment on the part of any medical journal not to do honor to his outstanding qualities as a teacher.

The late Dr. Joseph Bell, consulting surgeon to the Edinburgh Royal Infirmary, differed from most clinicians in this that the beaten paths affected

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by them were of small concern to him. By beaten paths we do not mean that he coldshouldered the scientific precepts of his predecessors or his coevals, but that he thought the case out for himself. Never overweighted by what others had experienced until they achieved a correct diagnosis after futile wanderings by devious ways, with no note in his remarks that would indicate that his mind was not his own but the pale reflection of some other which he was slavishly following, he grasped a clinical situation, not so much on account of the divination which accompanies genius, but on account of his power to observe what may have escaped a greater man. No detail, however insignificant, and also, it may be added here, however unscientific, failed to impress him; and by a synthesis that was deliberately arrived at, he unerringly scored where others with their burden of scientific facts and their own uncontrollable fancies would have failed. His method may not be a success in the hands of others, but it has this in its favor that it makes the eye of the clinician, by its unceasing alertness, the best adjuvant he can possess. How often have we seen expert clinicians cursorily "look their patients over" and then with one or two ideas in their heads hurriedly consult their textbooks in the hope that their "rare insight" into the case will be corroborated by some authority whom they have worshipped through years. This self-gratification is of almost daily occurrence; hence, the gist of the talk of any clinician taken at random resolves itself into that triumphant moment when he reads in his favorite textbook a verification of all he had surmised. But the Bell method—and really it is not farfetched to honor is thus—is another pair of sleeves, as our French confrères would say, for it lays greater emphasis on individual peculiarities as manifested by each and every case than on the most approved teachings of others; though by peculiarities is not meant the end to the means but rather the means to the end. But, of course, the mind of the clinician must be of the Bell calibre; and, as for the eye, can we ever hope that except in extraordinary cases this special organ will be put to its right use in clinical lectures?

It would be well for aspiring clinicians, who are not *au fait* with the characteristics of Dr. Bell's career, to read first the Sherlock Holmes books, since there they will be brought into the best sort of intimacy with those qualities which made him a power in the clinic. And after imbibing the Holmes method of making much of little things, a study of the real physician and teacher would not be inopportune, for directly this is done a realization obtains—provided the clinician is not a dolt—that the searching manner of the detective was in reality the manner of the medical man in all his clinical undertakings. And the lesson that will come home to a receptive mind will not be without point, since it will undoubtedly

make clear at once that the combination of Dr. Bell and Sir A. Conan Doyle, his pupil, cannot but be the means of throwing the greatest light on what should constitute the best method for making correct diagnoses.

SEA-WATER INJECTIONS VS. THE BULGARIAN BACILLUS.

The rapidity with which certain treatments are superseded by others of supposedly equal value appears to be the order of the day. It was but yesterday that a thrill passed through the medical world in regard to the superlative attributes of the Metchnikoff soured milk in entero-colitis, toxi-infections, furunculosis, acne, and eczema; and though for a time the older therapy, which had been applied to these diseases with varying success, wore a tattered raiment, it was not long before a complete rehabilitation took place. Just what the concensus of opinion is to-day as to the unusual qualities of the Bulgarian bacillus has never been published, but we fear the initial enthusiasm has been riddled by so many unkindly darts of criticism that it would require herculean efforts, on the part of some enthusiasts, to establish this special bacillus firmly in the second rank of our therapeutic agents. But why should one expatiate on the present demerits of what was but a few months ago acclaimed as the most alluring therapeutic toy, when newer methods of treatment are clamoring for the enthusiasm which is always part and parcel of the make-up of, alas! too many physicians.

The latest insurgent that is bludgeoning our citadel of indifference is sea-water, and not for recognition of the therapeutic value of sea-bathing either, but for the due appreciation of the high qualities of "isotonic plasma" when administered subcutaneously in enteric and skin diseases. According to reports which have come to us from the Dispensaries Marins of Paris and the recently established Quinton Dispensary of London, there can be no doubt that sea-water injections have "cured" in a marvellous manner; and what with the enthusiasm of the physicians on the respective staffs, and the lay press ever ready to publish the smallest crumb of medical gossip, another perfect page for our text-books has been evolved that shall light the way when our descendants are in doubt as to just how to cope with cholera infantum, eczema, psoriasis, and many other disturbances of the human organism. It is needless to point out that already a number of doubting Thomases are thrusting pin-pricks into what they regard as inflated reports, and are lashing themselves into a state of frenzy because they are sure "isotonic plasma" is not superior to isotonic or normal saline solution. But is it not a fact that opposition is always rife when enthusiasm is rampant? and is it

not a twice-told tale that small minds are continually on the alert to down all manifestations of genius, all innovations no matter how excellent, all radical advances that might breathe the salvation of the world?

Really when we hear from day to day the additions with which modern therapy is fortifying itself, we feel that perhaps our appreciation of the triumphant strides must be due to our innate lack of optimism. But, on second thought, it must be confessed that this quality, so necessary if smiles instead of frowns are to form the greeting of every new method of treatment, is not so negligible with us as would at first appear, but is merely slightly submerged on account of the many disappointments resulting from remedies which in their early audacities are not modest enough to limit themselves to the "cure" of one disease, but must needs include as many diseases as did soured milk some months back and sea water in its present flamboyant therapeutic state. In short, in the presence of marvellous therapeutic agents that scream multiplicity of "cures" from the housetops, we are at one with the landlord in "The Journey's End," a short story by Jeffery Farnol in the *Century* for November, when he says, "Soldiers I've knowed, and sailors I've knowed, but I never knowed nobody as had been a sailor *and* a soldier."

THE PATHOLOGY OF SPECIALIZATION.

Occupational diseases have been so thoroughly studied that one would suppose we could almost predict what will happen to a man after a few years of over-use of some organs and tissues with under-use of others in the special environments of his trade. Nevertheless, there is a neglected result of the monotony of the extreme division of labor which employers would do well to study, now that scientific management is being invoked to get more efficiency out of labor. Workmen are finding that, by these new methods in which division of labor is being carried to an extreme, the monotony is appalling. It becomes unpleasant, then laborious, all of which means that a given amount of labor requires more expenditure of energy to keep attention fixed. Exhaustion and inefficiency naturally follow. Labor unions are now beginning to think that for the sake of the man, it may be necessary to call a halt, and are insisting upon men having their work more varied. They argue that even if each day's output may be less at first, it will be more in the end because fatigued monotony is never efficient. Besides, the workman will live longer and be efficient longer on account of experience.

We must say that medical science is on the side of the workman in this matter. It is amazing how short is the working life in many trades, such as the more exhausting parts of the metal industries. Though most of

this destruction of vigor is due to over-exertion, there is no doubt in other lines that disuse of mental powers results in dementia, of a sort, to be sure, yet none the less as real as that following brain disease. He who elects to make his living by the exercise of one faculty in a tiny sphere must pay the penalty of atrophy of the rest. The middle-aged workman, incapable of work outside a limited specialty and even unable to think or talk of anything else, is as pitiful a sight as the broken-down actor; and modern industrialism is producing an increasing number for charity, so it is charged. Scientific management may thus save at the spigot and waste at the bung, if society is to be burdened with paupers worn out at forty-five, or even at forty. We must not expect from the human frame more than its capacity, and we must not let our prosperity kill us. There is plenty of evidence that in our mania to pile up national wealth we are paying too high a price. The game is not worth the candle, if we die in the winning.

Physicians themselves might take a hint, for our work is limiting us by ever shortening tethers and unless we slip our collars occasionally, jump the fence and nibble the grass in our neighbor's field, we, too, will find ourselves unable to appreciate anything out of our little area, even if we do see it. The danger of specialism has already been said to be ignorance of other specialties and the relation of all, and this necessarily makes one magnify the importance of his own. We often cannot see the woods for the trees, and it seems to be true that the more one knows in his own wood the more one is incapable of seeing other woods. Great discoveries are frequently, perhaps generally, made by men entirely outside the profession they revolutionize, for the reason that they are not blinded by its details. So we should not allow our special efficiency to make us resemble men looking through a microscope, but try to have a telescopic view of other fields even if we cannot see their details. Mental health as well as efficiency demands it. Otherwise we become staled by the monotony like modern workmen who, according to recent allegations, are being ruined by the craze for efficiency by a management which may prove to be far from scientific. Without possessing great versatility we need not destroy what we do have—or hide it under a bushel.

The reports of "worn-out" workers show that from 10 to 50 per cent., according to the trade, are disabled by neurasthenia. Much of this deplorable condition is of course due to over-strain and long hours without proper relaxation and recreation. Yet it would be worth while to go over the cases again and see if they are not caused by monotonous work which has allowed other faculties to atrophy. In other words, is neurasthenia the right word?

OPINION AND CRITICISM.

PAPER-BAG COOKERY.*

There should be considerable rejoicing throughout the world both among men and women that latterly attempts have been made to simplify our manner of living, especially in regard to the multiplicity of exactions which palatable cooking involves. The fireless cooker which has been with us for some years has many points in its favor; and though there may be some criticism advanced on the ground that the results are not so savory as when the cook-stove held its own against all innovations, all sense of appetite must be in abeyance if a meal thus prepared is visited with condemnation. Now no such charge has been preferred against paper-bag cookery; and since unsavoriness is undoubtedly the unkindest remark that can be made about anything that is supposed to be eatable, we may well congratulate ourselves that the age in which we live has produced so ingenious a culinary necromancer as Nicolas Soyer, late chef of far-famed Brooks's of London.

On closer range this matter of cooking with paper-bags has another aspect. In a country such as ours where a servant's wage is beyond the dreams of the small householder, the drudgery incident to cleanliness of pots and pans devolves on the woman of the household whom circumstances have compelled to exercise her arts in the kitchen. Who has not heard the reiterated complaint that, were it not for the labor involved in this menial work and the mental and physical weariness its daily exaction entails, cooking would not fall short of being a delight. And not until one begins to weigh this matter carefully does one realize the devastating inroads into a woman's organism, which are invariably effected by the continual moil of a near-approach to hygienic principles with respect to all utensils used, and especially to those cumbersome pots that require a deal of furbishing to bring them into a state of culinary respectability.

Physicians in general are really very poor social philosophers, for it is a fact that when they come in contact with the sort of household drudge whom we have attempted to describe, and study the why and wherefore of untoward symptoms, their minds fail to grasp the important part that medievalism, as it reigns in many respects in the kitchen of to-day, plays in the matter of a general "break-down." Of course, a recognition of a plebeian factor such as this would be contrary to the new scientific spirit which is so carefully fostered in the sick-room; but may we ask, in a

*Paper-Bag Cookery. By Nicolas Soyer, Late Chef of Brooks's Club, London. New York: Sturgis and Walton Co. 1911.

spirit of humbleness, would there be so many interesting "cases" to study had some physician of an inquiring turn of mind concentrated a few spare moments on the possibility of lessening the laborious duties of the housewife by bringing his thought into close juxtaposition with that of an inventive genius, so that a reform could be effected? But as has so often been done before, the long-looked-for millennium has come from a non-medical man; and though the inventor may have had no other thought than how best to retain the aroma of food, his name should not be without honor in the medical annals of this century for a successful attempt to combat the essential cause of many a "case" of jangled nerves.

AGAIN "MEDICAL NEWS AND THE DAILY PRESS."

Sometime ago, in a note in this column, we criticised the miserable manner in which medical news was handled by the daily press, and we offered a suggestion that the best service to the public, the paper, and the physician could be rendered only by a close medical supervision of medical news. It was hardly to be expected that the suggestion would be accepted, and we still find pages of well-edited sporting gossip to every line of garbled medical news. Even those papers which aim to give the public honest journalism see nothing paradoxical in maintaining a standard of absolute truth in one thing and of what is worse than untruth in another. Certain medical news logically belongs to the public through the medium of the daily press, but it belongs to the public as true news and not as sensational misstatements of partial truths. A great paper to-day has a corps of editors on regular and special subjects, but the medical editor still has his existence in the realm of dreams. Therefore we more than welcome any indication that the stuff of the dreams may be nearing substantiality, and we more than congratulate the big daily of Chicago which has annexed, as special writer on subjects pertaining to public health, a man whose previous history shows clearly an unusual ability to handle such subjects. We believe that every inch gained is well earned, and as the fall weather produces an inclination toward optimism we can make ourselves believe that in the future medical items may be given the square deal, and that the poor public already burdened with the mystery of medicine may know at least that the papers will take the trouble to sift the chaff from the wheat of medical news. *Veritas pro bono publico.*

LITERARY NOTES.

In "Courtship Under Contract—The Science of Selection" (The Health-Culture Company, New York), the reader will find many lines which indicate that the author, James Henry Lovell Eager, has but small use

for the standards so industriously upheld by the majority of authors who follow the craft of novel-writing. That there is a complete secession is indicated on nearly every page; and when there is so sudden a wrenching from what the conventional mind conceives as right and proper in a novel, it is not surprising that the ordinary critic should stand aghast. To illustrate the originality of this book, one passage should suffice; and though there are many others that are just as unusual, we feel that this one will be an "open sesame" to all the others. The heroine has received a marriage proposal from a comparative stranger and, in reply to his mellifluous speech, says: "Mr. Guy, I am not unmoved by your declaration, neither am I indifferent as to its outcome. It is not unmaidenly to admit that I am drawn to you by no uncertain feeling. . . . Neither of us can fathom the peculiar features of our hidden natures. Character is never an open book printed in cold type, in which a study of it might be made. Only the trials of life and the uncovering of our several weaknesses can inform us whether a life with the other would be endurable and produce happiness. . . . I must insist upon conditions before I would enter into marriage relations with any man. . . . I am not a follower of Ibsen or Shaw, but I hold that the bond of marriage should not be entered into until we shall know each other, and know that a summer romance is not love. I desire fully to know the man before I yield myself to him as wife; and to know positively that there is a mutual love existing between us that will stand the test of time and the conflict of ideals, and to that end I propose to enter upon a probationary period of time, say for six months, during which time I will be his housekeeper and companion, having my own apartment under his roof, but being mistress of my body while we study each other." All this when she was in full possession of "the honest candor of an unsophisticated girl"; and we marvel what her ideas must have been at the sophisticated age, say thirty, though never "a follower of Ibsen or Shaw."

The ninth issue of *Aesculape* is not less interesting than all the preceding issues. This may not seem high praise to those who have not read this excellent French monthly, but to those who are not strangers to its many good qualities, it means that the editor, Dr. A. Rouzaud, is keeping the promises which he made when this journal was first published. These promises were something quite new in medical literature, for they set forth that a medical journal would be published that would combine medicine and literature and art in a way not attempted before. All the issues have borne witness to these promises; and if we single out the ninth it is only because it is the latest. What could be more interesting than Professor Grasset's "Un Demifou De Génie: Auguste Comte" (Auguste Comte: A Semi-insane Genius), Dr. Ameuille's clever

presentation of Dr. Villandre as surgeon and painter, Dr. Paul Laffont's socio-historical sketch of Saint-Lazare with startling illustrations from the paintings of Kupka recently exhibited in the Salon des Indépendants, that artistic home of the bizarre, and others which are equally interesting and whose illustrations have been selected with judgment. The quality of this sort of journal could reach the high-water mark only in France, for there the interrelation between medical science and literature is closer than in any other country, and physicians, though deeply engrossed in medicine, know what it means to all intelligent readers not to sacrifice the literary quality on the altar of science.

Those vital questions, marriage and parenthood, are discussed in a capable manner by the Rev. Thomas J. Gerrard in his book "Marriage and Parenthood: The Catholic Ideal" (Joseph F. Wagner, New York). Aside from the deeply religious tone and the bias which is really an integral part in the discussions, the contents of this book are not without merit; and since it is a fact that the scientific talks on morality, as given forth by the physician, have not as yet made much headway with the laity, perhaps a book of this sort is an excellent substitute. From any point of view a well-written book should command attention, and by well written we do not limit ourselves to the lucid English, but to the sincerity and earnestness of the pervading tone. Moreover, an ideal, no matter whether religious or purely social, deserves great praise, for if there is to be a standard for our morals—and surely all physicians are of this opinion—then something that is a little higher than the accepted standard of to-day would mean a striving for a cleaner life.

In Dr. Charles Reinhardt's "Faith, Medicine and the Mind" (London Publicity Company, London), the reader will find a sane exposition of all those subjects which may be grouped under the term, occultism. Of course, if the reader is decidedly stubborn in the matter of accepting what has latterly been called the newer phase of medical treatment, though it has always been practised at the bedside by the shrewd practitioner, he will close the book at once; but it may be added here, for his benefit, that this procedure would be unwise, for by allowing himself some degree of receptivity his profit will not be a negligible quantity. Physicians of to-day may or may not pin their faith entirely to hypnotism, suggestibility, telepathy; but they must be aware of the fact that mental medicine has enough good points to merit better treatment than has been accorded it in the past. To say that something, which is not so apparent to our understanding that a ready grasp can be effected, should

be consigned to the limbo that holdeth much nonsense, is really a confession of one's narrowmindedness and an attitude that cannot but invite unkindly criticism. Now Dr. Reinhardt's book is no fantastic performance, but a calm survey of matters which some of the greatest medical minds in modern times have sought to explain. Whether or not this latest excursion into the shadowy realms beyond the range of ordinary knowledge is illuminating enough to bring the subjects within closer range, so that the reader of intelligence will no longer be in a state of doubt as to their merits, is a knotty question to decide and dependent to a great extent on one's bias. But what can be said with surety is that any book, that is so well written and so equable in tone, as is this one, when the temptation to exaggerate is ever present in discussions of occultism by enthusiasts, is a step in the right direction, for by its poise a convincingness is brought home to the reader that never obtains when a visionary view of "the marvels beyond science," as Grasset puts it, is taken.

That the individual should be the respecter of social laws is the emphatic note of "Crime and Insanity" by Dr. C. A. Mercier (Henry Holt and Company, New York). But when he fails in his duty, when he outrages public decency by committing crimes, when he shows a disposition to act according to his dictates unrestrained by any desire to regard the life or property of another except as subject to his own conception of the law of vengeance, then this same individual fails to recognize the limitations set upon him by law and order and must be treated as a criminal. That the criminality of his various acts can be proved beyond a doubt is not so momentous, according to the author, as whether the motive emanated from a mind held in the leash of sanity, or from a disordered imagination that is incapable of differentiating between right and wrong. This distinction is a very important point that cannot be dismissed in a cursory manner; hence, it yields opportunities to an author to expatiate on its many ramifications. That Dr. Mercier avails himself of all the pros and cons need not be emphasized here; perhaps any other writer would do the same; but what should be asserted is that few could present the matter in so interesting and concise a manner. In the 250 pages of this book there may not be anything of a startling nature that would move the seasoned criminologist to enthusiasm; but since few of us are adepts in this special chapter of science, it is well that such books as this are published from time to time. And, moreover, the medical expert in insanity as a motive to crime need not disdain this little work, for in it he will find what is so rarely described in his textbooks—namely, "the constitution of human nature and human society, and . . . . researches into the means of preservation of life in general."

ORIGINAL ARTICLES.

THE SURGICAL TREATMENT OF PUERPERAL INFECTIONS.

By Palmer Findley, M. D., of Omaha,
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The frightful ravages of puerperal sepsis began with the inauguration of maternity hospitals and continued to the time when antisepsis was effectively put into practice in such institutions. To-day it may be fairly stated that the percentage of morbidity and mortality of puerperal sepsis in hospitals has been materially reduced, while in private practice there has been little or no reduction.

Furthermore, the mortality of childbed fever has been little reduced by tentative measures. This fact is generally appreciated, and we find ourselves confronted with problems involved in the surgery of puerperal infection. We ask:—

Can a local infection be checked in its progress by surgical means so that contiguous structures may not be invaded by the infecting micro-organisms? And again:—

Can a toxemia or bacteriemia be averted by the timely removal of the primary focus of infection?

These vital problems are engaging the attention of all obstetricians. A perusal of the literature convinces me that they can only be solved by more extended clinical and laboratory observations.

Intelligently to apply operative measures, we must know the nature of the infecting micro-organism, and we must know the limit to which the infection has extended. Were this all that is required, I apprehend that the surgical treatment of puerperal sepsis would be readily placed upon an intelligent, rational basis. But we are confronted by a more difficult problem; one which now seems unlikely of solution with our present possessions in diagnosis and prognosis.

How are we to foresee the ultimate outcome of a given case with or without surgical intervention? We treat a case along conservative, non-operative lines and the patient dies. Could we have saved her by timely surgical intervention? We resort to surgery and the patient lives. Would she have lived without operation? Death follows upon surgical interference. Did the operation contribute to the fatal issue or would the patient have died without surgery?

It is a difficult task to formulate the indications for surgical interference in puerperal sepsis because the course of the morbid processes is at times difficult of recognition. This is so because we possess no reliable clinical or bacteriological guides. At the onset of the infection we are unable to foresee the ultimate outcome of the disease. If we adopt tentative, conservative measures the infection may go beyond our control; whereas, if we resort to radical measures at the very onset of the infection, we may, perchance, hasten a fatal issue, or we may later have reason to reflect upon our act as a questionable procedure—a sacrifice that might have been averted had we proceeded with more deliberation.

It is true that adequate laboratory facilities will reinforce our clinical observations so that we can determine with a fair degree of certainty, and at an early date, whether we have to do with an infecting germ of low virulence or of high virulence, and whether the infection is localized or has gained access to the general circulation of the blood. These facts are of the utmost importance and will often serve to determine the prognosis and course of treatment with a fair degree of certainty. Yet with all these facilities at our command we are often in doubt as to the proper course to pursue in the early stages of the infection.

The streptococcus has long been regarded as not only the most commonly found organism in puerperal sepsis (86 per cent. of all cases according to Zangemeister), but by far the most virulent. The recent observations of Fromme, Veit, Bumm, Heynemann, Gonnet, Mayer, Barsch, Zangemeister and others have given us a clearer insight into the nature of the streptococcus as found in the genital tract and blood. Streptococci are found in the lochia of the normal puerperium, but they are of low virulence. Zangemeister found streptococci in the vagina of pregnancy in 32 per cent. of cases, and by the fourth day of the normal puerperium in 76 per cent. of cases. It is, therefore, evident that the mere presence of streptococci in the vaginal secretions is of no special significance in relation to puerperal sepsis. We must go further and determine their degree of virulence.

We are indebted to Fromme for what he believes to be a fairly accurate and practical method of distinguishing between streptococci of low virulence and of high virulence.

Fromme has found that strains of streptococci, which grow poorly in his bouillon-lecithin mixture are generally derived from fatal infections and therefore correspond to the virulent type, while those which grow almost unhindered upon this mixture in concentrated form come from puerperal cases which, in the great majority of instances, have a favorable prognosis; these streptococci, therefore, are to be considered as less virulent, *i. e.*, as saprophytes. Fromme does not presume to give an explanation for these findings.

Reibmayr contends that the bouillon-lecithin mixture of Fromme is not a reliable guide in distinguishing the virulent from the saprophytic

forms of hemolytic streptococci. His opinion is based upon extended observations which have brought him to the conclusion that the distribution of the streptococci throughout the body and the development of severe infection depends mainly upon the susceptibility and resistance of the infected organism, and even more so on that of the infected organ.

It is known that non-hemolytic streptococci rarely cause severe sepsis and that hemolytic streptococci commonly produce, not only a more or less extensive local infection, but are prone to produce general sepsis. But it is further known that hemolytic streptococci show great variations in their degree of virulence. They have been found in the vulva and vagina of normal pregnancy and in the normal puerperium in a small percentage of cases. It has been a long accepted theory that germs found in the bood indicate a grave prognosis. Bumm, however, has observed bacteriemias in which recovery was rapid after removing the primary focus, and Baisch (*Zentralblatt fuer Gynækologie*, No. 28, p. 963, 1909) has shown that fatal sepsis may result in the absence of bacteriemia. *Hence it follows that a bacteriemia is not necessarily fatal,—that the micro-organisms within the blood may be of low virulence.* Fromme has demonstrated the presence of saprophytic micro-organisms in the blood, and their presence in the blood speaks for a favorable prognosis. In the first twenty-four hours of an infection no streptococci have been found in the blood. If prior to their appearance in the blood we are able to form an accurate estimate of their number and of their virulence as found in the lochia, we may find a valuable suggestion as to the proper course to pursue. Between the cases of purely saprophytic infection and those of a virulent bacteriemia, there are many forms of infection which do not permit of ready classification. Such, for example, are the gonococcic infections which are usually superficial and the streptococcic infections which deeply invade the pelvic tissues, but do not gain access to the blood. According to Veit, pus accumulations in the pelvis rarely contain streptococci of high virulence. Unfortunately we do not know why it is that these germs vary so in their virulence; whether the cause rests with the germs themselves or with their environment, probably the latter. Hence, it follows that with our present state of knowledge we are not in command of methods which will serve as infallible guides for our management of these cases.

If we find hemolytic streptococci in the lochia at the onset of an infection, we fear the development of a general sepsis, and by repeated blood examinations we are able to develop our prognosis, but we cannot in any case say at the onset that these hemolytic bacteria will or will not invade the blood; hence, we cannot be certain as to the advisability of removing the uterus as a means of preventing a general infection. *Yet, if good is to come from the removal of the uterus or from the ligating of veins or from the removal of infected placental rests, surgery must be invoked prior to the development of a blood-infection.*

This much we know: non-hemolytic streptococci commonly give rise to mild forms of sepsis, while hemolytic streptococci give rise to both mild and severe forms of sepsis, the extent of which depends upon the number of micro-organisms, their degree of virulence and the tissue-resistance of the individual. In the severe types of sepsis we have to do almost exclusively with hemolytic bacteria. We may be assured that the finding of hemolytic streptococci in the blood calls for a guarded, though not necessarily hopeless, prognosis, the mortality of hemolytic streptococcemia being 80 to 90 per cent.

Sigward reported a fatal case of non-hemolytic streptococci in the blood. He examined 56 fever-free patients in the puerperium, and in 40 of this number (71 per cent.) there were streptococci in the lochia, 38 of which were hemolytic. And again Heynemann examined 50 fever-free puerperal women in Veit's clinic and found hemolytic streptococci in the lochia of 31. These experiences could be multiplied, but enough are quoted to emphasize the well-known fact that hemolysis and virulence do not necessarily go hand in hand; that the finding of hemolytic streptococci in the lochia justifies no more than a guarded prognosis; that the pathological significance of streptococci must be judged clinically and not bacteriologically.

According to Sachs the prognosis is dependent upon three factors, *i. e.*, the resistance of the individual, the location of the infection, and the character of the infecting micro-organisms.

With these fragmentary introductory remarks on the essentially causal factors in the production of puerperal sepsis and their bearing upon the surgical treatment and prognosis of puerperal sepsis, we will briefly consider the various surgical procedures which are proposed for the treatment of these cases.

All authorities do not agree upon the advisability of removing retained placental tissue prior to the development of septic infection. Winter counsels delay and the administration of ergot. He argues that the spontaneous expulsion of placental rests is less likely to be followed by the development and spread of infection than is the artificial removal. Mayer takes issue with Winter and I believe he voices the opinion of the profession at large. He would remove placental rests with the least possible injury to the uterus and at the earliest possible moment, believing that placental remains may harbor saprophytes which in time may become virulent.

Curettage of the infected uterus is universally condemned. It is generally conceded that a thorough curettage of the puerperal uterus is a difficult and dangerous task. "The curette is blind," and is capable of much mischief in the hands of the skilled as well as the novice. In the presence of virulent streptococci the danger is greatest because the inevitable wounds created by the curette will almost certainly be infected and then follows an extension of the infection to the uterine musculature,

the pelvic connective-tissue, the appendages, the peritoneum, and to the general circulation of the blood.

Hysterectomy.

Extirpation of the uterus has been practised in well-selected cases. Mayer would remove the uterus, first when it is the primary focus of infection, and secondly when the infection is confined to the uterus. While the uterus is the primary focus of infection in most cases, it must be borne in mind that the infection may come from the cervix, vagina, vulva, appendix, tonsils, and other tissues.

It is one thing to determine the original focus of infection and another and more difficult task to determine the extent of the infection. We may readily decide that the endometrium is involved, but to say with absolute certainty that the infection has or has not invaded the musculature of the uterus or the parauterine tissue is impossible in the early stages, at a time when such knowledge would be of the greatest benefit. We must confess that as yet we have no certain means of determining the exact limitations of an infection. The clinical signs cannot be relied upon, and, since it is a physical impossibility to take cultures from the deeper-lying tissues, we are at a loss to formulate a plan of action that will insure success in the early management of these cases. Shall we adopt the practice of early extirpation of the uterus in all cases in which there is a virulent streptococcic infection in the uterus, but as yet not in the blood? If we do so there will be much needless sacrifice, for many such cases go on to recovery without such heroic measures and, furthermore, there is the chance of spreading the infection through fresh wounds created in the operation. On the other hand, if we are to wait until it is known that the infection has spread beyond the uterus, the removal of the primary focus will be of little or no avail.

The German Congress of Gynecology and Obstetrics, of last year, discussed this subject, but arrived at no definite conclusions. My own impression, gained from reading their transactions, is that we are not as yet in possession of sufficiently accurate means of diagnosis to make possible the formulating of definite rules.

Hysterectomy in puerperal infection was first performed by Schultze. Hegar followed him with another case. Both cases died. America, and then France, adopted the operation, but in all three countries there has been little practice and much discussion of the subject. All agree that the infected uterus should be removed when possible where it has been perforated or torn, where sloughing fibroids are inaccessible to myomectomy, where multiple abscessses are recognized in the uterine wall, and where the infected placenta cannot be removed through the natural channel. In all these conditions hysterectomy may be permissible provided the infection has not become general and the strength of the

patient will permit. Under these conditions Fehling recorded 61 cases with 55.7 per cent. of mortality; Fause 13 cases (results not given); Herff 7 cases with 4 recoveries; Henkel 3 cases with 3 recoveries; Veit 4 cases with 4 deaths.

Herff records the only case of recovery in which hysterectomy was performed in the presence of a streptococcemia. On the other hand, Hynemann (*Archiv fuer Gynækologie,* Heft I, LXXXV, 1908) reported 18 cases in which the streptococcus was found in the lochia but not in the blood; all recovered.

Veit would have it that he who operates many of these cases operates too many, and he who has nothing but good results has operated unnecessarily.

I would not undertake to lay down definite rules because of our many shortcomings in diagnosis and prognosis, but I would offer the following suggestions:—

1. In streptococcic endometritis no surgical intervention, *i. e.,* curettage or hysterectomy should be attempted for fear of speading the infection. I am well aware that a timely hysterectomy in these cases might forestall what would otherwise develop into a fatal septicemia, but the opportunity will seldom present itself in time to be sure that the infection is confined to the uterus (within twenty-four hours). Furthermore, the mortality of the operation, the possibility of extending the infection by creating fresh wounds, and the impossibility of determining with certainty that the infection would invade the blood-circulation were no operation performed, will deter one from taking such heroic steps. Vineberg, while expressing his doubt as to the advisability of extirpating the uterus under such conditions, finds some encouragement in the experiment of Zangemeister who injected virulent streptococci into the tails of mice and found that he could save the life of the animal by amputating the tail within twenty-four hours. These experiments are all the more worthy of consideration because of the fact that mice are less resistant to streptococcic infection than is the human species.

2. In putrid endometritis, which includes sloughing fibroids and placental rests which cannot be removed by the fingers or instruments, the uterus should be removed provided the infection is localized in the uterus. In the 30 cases of Wormser there was a mortality of 23.3 per cent.

3. In multiple abscesses of the uterine wall and in perforation or laceration of an infected uterus, hysterectomy is advisable. Wormser finds a mortality of 47 per cent. in these cases of perforated wounds and 26.8 per cent. of multiple abscesses.

4. It may be reaffirmed that to anticipate a generalized infection by extirpating the uterus, when the above conditions do not prevail, is unwarranted in the light of our present knowledge and experiences.

5. Where only bacteria of putrefaction are found in the uterus,

placental fragments should be promptly removed. These organisms will not attack fresh tissues.

6. Drainage of the uterus must be unobstructed, otherwise the sepsis will be heightened. Cautious dilatation of the cervix from time to time will adequately provide for drainage, and if the uterus is to be irrigated at all only normal salt solution or sterile water should be used, and sparingly so, for fear of spreading the infection. Rarely is it necessary to introduce a rubber drainage tube or gauze through the cervix.

7. Retained membranes can be safely left to nature. They are not easily infected and are usually cast off without creating additional wounds. In fact placental fragments seldom create other than a local infection unless the placental site is wounded in the effort to remove the placenta, and then there is danger of spreading the infection. Winter reported 22 cases of retained placenta; 13 were fever free and the remaining 9 were mild infections.

Ligation of the Pelvic Veins.

The practice of ligating the veins in puerperal pyemia, as introduced by Trendelenburg, is of great interest and of much promise. Death from pyemia results from the distention of thrombi, from bacteriemia and from metastasis.

If in a thrombophlebitis we are to prevent the onward spread of the infection, the veins must be ligated above the point of infection. It is possible to circumvent a general infection by ligating the common iliac vein above the thrombus when the infection has extended to this point on the one side. If the process is bilateral, both hypogastrics and spermatic veins may be ligated, or the hypogastric and spermatic veins on the one side and the common iliac and spermatic veins on the other and more affected side.

It is hazardous to ligate the veins in the acute stage of a pyemic infection. Bumm, Steinberg, Stromm and many others justify the procedure in the chronic stage. Seitz and Wormser record 37 per cent. of recoveries following ligation of the veins in chronic pyemia; an improvement over conservative methods formerly practised. Latzki, with an experience of 187 cases of septic thromboses, operated twenty-eight times with ten recoveries, which he says is a good showing considering the serious nature of the cases. Williams (*Amer. Journ. of Obstetrics,* 1909) gives the mortality of puerperal pyemia at 66 2/3 per cent. In 41 cases treated by the transperitoneal method, excluding those which were not susceptible to cure at the time of operation and those in which faulty technique was applied, there was a mortality of 21.4 per cent. Williams reported 5 cases with a mortality of 20 per cent. Koblanck ligated 6 cases with two recoveries. The transperitoneal route is preferred to the extraperitoneal route approached through the flanks for the reason

that the extent of the involvement of the veins can be clearly ascertained. Contrary to early expressed opinions, chronic bacteriemias are not necessarily fatal. O. V. Herff estimates 30 to 40 per cent. of recoveries, and in both acute and chronic forms of bacteriemias a mortality of 70 to 75 per cent. As yet, there are not a sufficient number of cases operated by approved methods and the proper selection of cases to justify any definite conclusions as to the merits of the procedure. We believe, however, that the ligation of veins at the right time and in the right place is a rational procedure and will be more and more justified as we develop our facilities in diagnosis and prognosis. Certainly the results so far obtained show a signal advance over the methods heretofore practised.

Peritonitis.

The treatment of acute diffuse puerperal peritonitis is most discouraging—this in marked contrast to that of general peritonitis following appendicitis. This is true because in diffuse puerperal peritonitis we have to do with micro-organisms of high virulence and the resistance of the individual is commonly low; whereas in peritonitis following appendicitis the micro-organisms are usually of lower virulence, and the resistance of the individual is commonly high. Then, too, there is better opportunity to establish direct drainage of the primary focus of infection in appendicitis.

Murphy says, in a personal interview, that the reason for the high mortality in puerperal peritonitis, so-called, as compared with peritonitis following appendicitis is that the peritoneum is involved secondarily in puerperal sepsis; that in puerperal sepsis we have to do with a subperitoneal cellulitis. While this is true of a limited number of cases, it cannot be said to be the rule, and, therefore, fails to answer the question in point. In the vast majority of cases the infection spreads from the uterus to the tubes and then to the peritoneum. More rarely it extends through the uterine wall to the peritoneum as in accidental perforation of the uterus.

Acute diffuse puerperal peritonitis is generally regarded as fatal unless operated. Where the infection has spread through the blood-circulation, drainage of the abdomen will be of no avail. If the blood is sterile, no time should be lost in establishing free drainage. Fortunately the blood is late in being invaded in these cases.

All will agree that early and free drainage of the peritoneal cavity is imperative. Of this there is no question, but the difficulty lies in the making of a diagnosis early enough to insure good results. Where the infection has spread directly through the uterine wall to the peritoneum we have to do with germs of high virulence and drainage of the abdomen will rarely be successful. If, on the other hand, the infection invades the peritoneum by way of the tubes, we more often have to do with

germs (streptococci, staphylococci, gonococci) of lower virulence; hence, the results from drainage are correspondingly better.

In general, the technique of abdominal drainage, of the continuous administration of salt solution by the bowel, and of the enforcement of Fowler's position, does not differ from that practised in the management of peritonitis following appendicitis, and will not be discussed here in detail. It is, however, of great importance to consider the advisability of removing the primary focus of the infection.

If the uterus has been perforated or lacerated, its removal is advised, provided the condition of the patient will permit. If it is evident that the patient cannot withstand so formidable an operation, a dam of gauze should be placed about the uterus. Where the infection has spread from the tubes, their removal is advised if the condition of the patient will warrant. A ruptured pus-tube should be removed. There is some difference of opinion as to the advisability of flushing the abdominal cavity with salt solution, but the concensus of opinion is strongly opposed to the practice. Where there is great distention of the bowel that is not relieved by drainage of the peritoneal cavity and by the usual means employed for the expulsion of gas, multiple punctures of the bowel may be made.

Fromme reported 12 cases operated for acute diffuse peritonitis. Six of this number were lymphatic invasions; all died. But 2 of the 12 cases recovered. These experiences do not condemn the practice of draining the abdominal cavity, but serve to emphasize the necessity of an early diagnosis.

We have a suggestion in the practice of Latzki who makes an exploratory abdominal incision early in suspected cases of peritonitis. Henkel advises an early exploration through the cul-de-sac and the taking of cultures from the peritoneum.

The prognosis depends much upon the nature of the infecting organism. If there is a gonococcus, or a mixed colon infection, the outlook is relatively good; if there is a streptococcus infection, the prognosis is bad.

Bumm drained 45 cases with recovery in 48 per cent.; Wormser 177 cases with recovery in 37 per cent. Latzki operated 47 cases of puerperal peritonitis out of a total of 125. Of the 51 cases not subjected to operation but two recovered; of the 47 operated 17 (24 per cent.) recovered. He observes that none of the cases with great distention of the bowel recovered. He makes a median incision from the umbilicus to the symphysis, one in either flank and four in the cul-de-sac, through which rubber drainage tubes are inserted. If there is great distention of the bowel, which is not readily controlled by eserine, he makes multiple punctures in the bowel.

In the fulminating forms of peritonitis no good can come from surgical interference. In the less virulent forms early drainage is imperative. This calls for an early diagnosis and suggests the advisability of making exploratory punctures and incisions.

Conclusions.

I would present for your consideration and criticism the following epitomes of the methods of treating puerperal sepsis:—

1. As yet we possess no reliable clinical or bacteriological guides in the early management of puerperal sepsis.

2. Operative treatment, when administered in a timely and skilful manner, can do much to prevent the extention of infections. But it is well to bear in mind that untimely surgical interference and the faulty application of surgical measures may be productive of much harm.

3. Retained placental tissue should be removed before the onset of septic infection. Membranes may be left to nature unless they protrude from the cervix or interfere with drainage. In virulent streptococcic infection, the infection-organisms may gain access to the blood through the wounds created in the act of removing the placenta; hence, in these cases, it is better to encourage the spontaneous expulsion of placental tissue by the administration of ergot. Failing in this the uterus must be emptied by mechanical means. The fingers are preferred to the curette or placental forceps. If, for anatomical reasons, the infected placenta cannot be removed, and no blood invasion or metastasis exists, hysterectomy may be considered.

4. Puerperal ulcers should not be curetted for fear of extending the infection.

5. If hysterectomy is to accomplish anything, it must be performed when the infection is confined to the uterus. Under these conditions, and in the presence of multiple abscesses of the uterine wall, of infected fibroids, of inaccessible placental tissue, of perforation of the uterine wall and possibly of infected appendages, hysterectomy is advised. It is questionable, without present endowments in diagnosis and prognosis, if we are ever justified in removing the uterus in the early stages of puerperal infection, while the infection is confined to the uterus, and in the absence of the above-mentioned complications.

6. The timely ligation of veins in puerperal pyemia may forestall a general infection; but as in hysterectomy it must be done before the development of a general bacteriemia and metastasis, and the infected thrombi must not extend beyond the common iliac vein, nor can it be bilateral to this extent.

7. The treatment of acute diffuse puerperal peritonitis is free drainage, the problem involved is that of early diagnosis.

8. Pus accumulations within the appendages, the parametrium or the pelvic peritoneal cavity, are seldom highly virulent and can therefore usually await the subsidence of the acute stage. In these cases, drainage should be established per vaginum, rarely through an incision immediately above Poupart's ligament.

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THE MODERN TREND OF PSYCHIATRY.

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We stand at the threshold of a new and brilliant era in medicine. The wonderful advances of the last decade are but the forerunners of others which will unquestionably mark the end of empiricism and dogmatism. This advance has been general. Since the introduction of asepsis in surgery by Lister, the present generation has witnessed a succession of noteworthy innovations. Koch's tubercle bacillus, the antitoxin treatment of diphtheria. the treponema pallidum, the Widal diagnosis of typhoid fever, the value of tuberculin in the diagnosis and treatment of tuberculosis, the Roentgen ray, the vaccine therapy of Wright, the Opsonic index, the Wassermann reaction, the Flexner serum treatment for epidemic cerebrospinal meningitis, and Ehrlich's "606" are but a few of the discoveries which have followed each other with startling rapidity. But what of psychiatry? Has it kept pace with the other branches of medical science? Until recently there were no signs of any awakening or advancement. The psychiatry of Esquirol, Maudsley, Clouston, Regis, Blandford, and Krafft-Ebing with few variations and additions was not far removed from that of Pinel. Mania, melancholia and dementia with idiocy, imbecility, paranoia, and general paralysis of the insane constituted practically all that was known of insanity. Its etiology was very vaguely understood. General paresis was attributed to alcoholism, overwork and sexual excesses rather than to syphilis. Nothing was known of the pathology of the diseased brain, and interest in insanity was confined entirely to efforts at classification. This was based on symptomatology, pure and simple. Excitements were called mania, and depressions, melancholia, and there was apparently no desire to go any further into a field where speculation was considered idle. This condition of affairs pertained for many years, but finally evidences of dissatisfaction appeared and various investigators advanced entirely new conceptions of psychiatry. One of the first of these to really influence the profession was Kræpelin who was largely responsible for manic depressive insanity, dementia præcox, and involution melancholia. Kræpelin called attention to the fact that mania and melancholia frequently occur in the same individual at various times, often with frequent attacks but no tendency toward dementia or deterioration. This class of cases he grouped as manic depressive insanity and pointed out the special features which characterized it as follows: In the manic attack—elation, flight of ideas,

distractibility and psychomotor excitement. In the depressive forms—mental depression, difficulty of thought with dearth of ideas, retardation and motor inactivity. These cases recover, suffer from recurrent attacks and do not tend towards dementia as a rule. He showed that certain forms of depression characterized by anxiety, agitation, fear, restlessness, self-accusation, delusions of persecution, marked suicidal tendencies, etc., were common to the involution period and to these anxious depressions he restricted the term melancholia. Kræpelin's studies showed that certain cases of depression or excitement which have a tendency to terminate in dementia after one or more attacks have certain definite characteristics which he grouped together in his conception of dementia præcox. In this group he includes the diseases formerly described as hebephrenia, katatonia, and the cases described as mania and melancholia which terminated in dementia. He showed that these have certain definite characteristics which may be briefly summarized as emotional apathy and dullness, phantastic delusions, active hallucinations, mannerisms, negativisms, stereotopies, verbigeration, mutism, stupor, catalepsy, etc., ending eventually in dementia. This may be spoken of as a symptomatic prognostic classification, and is of extreme value as throwing a great light on the outcome of the psychosis. Given sufficient symptoms to warrant a positive diagnosis of manic depressive insanity or dementia præcox, we can fearlessly give a definite prognosis. Manic depressive cases recover, dementia præcox does not. This is a most important advance. It is not to be assumed, however, that a definite diagnosis is a matter of simplicity. It is often extremely difficult as many of our cases do not conform to these definite disease types. Kræpelin has made an indelible impression on psychiatry, not only on the continent, but in this country where his classification is now in almost universal use. In the meanwhile others have not been idle. Wernicke advanced an entirely new and different conception of insanity. He advocated the theory that all mental diseases are due to disorders of the associative functions of the brain in contra-distinction to disorders of the projection apparatus of the cerebrum, which connects the higher brain centers with the peripheral sensory and motor mechanisms and gives rise to nervous diseases. He thus puts psychiatry on a definite anatomical and pathological basis. These lesions may occur anywhere in the psychical reflex arc, in which he includes the psychosensory tracts or receptive mechanism, the intrapsychic tracts or elaborating mechanism, and the psychomotor mechanism. This conception of the origin of mental disturbances is interesting and attractive but lacks anatomical proof. It has not been generally accepted, although Wernicke has many followers and has done much towards encouraging further study.

Kræpelin assumed dementia præcox to be an autotoxic condition accompanied by certain definite changes in the cerebral cortex. This was based partially on theory and partially on the results of elaborate studies of the pathology of the brain by Nissl and Alzheimer. These dis-

tinguished pathologists have contributed very largely to our knowledge of the changes in the neurones and their significance. Although much has been accomplished in this direction we are far from a solution of the problem. Many of the changes in the brain cells have been shown to be entirely due to terminal conditions and these changes and alterations have been shown to assume definite forms. Thus what has been described as acute alteration is now known to be due merely to high temperatures, as in febrile conditions. Other definite types are grave alteration, a terminal condition, shrinkage (due to edema), rarefaction, the pigmentary degeneration of senility, and axonal alteration, a condition due to a degeneration or injury of the axone of the cell.

It was thought by many that the autotoxic origin of mental disturbances could be demonstrated by studies of the changes in metabolism. This led to elaborate researches in the study of the blood, urine, etc. Exhaustive investigation of the urine by Folin showed many interesting results, but did not accomplish what was hoped for. A study of blood-pressure in the insane brought out the interesting fact that pressure is decreased in excitements and increased in depressions.

To Nissl and Alzheimer we are largely indebted for a definite knowledge of the pathology of general paresis. In addition to the well known gross changes in the brain we find an infiltration of the pia arachnoid and vascular sheaths by lymphoid and plasma cells. Although occurring in other conditions the presence of plasma cells in these localities is almost pathognomonic of general paresis. In the cortex there is a neuroglia proliferation, a budding of capillaries with a great increase in vascularity, the presence of numerous satellite cells, rod or *stæbchenzellen*, a disturbance in the layers of the cortex, any or all of the characteristic cell alterations already spoken of and a degeneration of the nerve fibres. The etiology of general paresis has been an interesting field for research. The "bacillus paralyticans" of Ford Robertson was one of the earlier efforts in the direction which is now generally discredited. The discovery of the treponema pallidum of Schaudinn, improperly called the spirochæta pallida, and the demonstration of its definite connection with the etiology of syphilis, have had an important bearing on the study of general paresis. The Wassermann reaction has practically cleared up all doubts as to the relation of general paresis to syphilis, a relation which was suspected by many for years, although such a reputable authority as Kræpelin could find a positive history of syphilis in only 34 per cent. of his cases. The diagnosis of general paresis has been greatly simplified by our knowledge of the fact that the infiltration of lymphocytes in the meninges of the brain and cord can be demonstrated by an examination of the cerebrospinal fluid. Lumbar puncture was introduced by Quincke in 1890 and the researches of Widal, Ravaut, and Sicard have afforded us a definite method of demonstrating the presence of an increase of lymphocytes in the spinal fluid. The Fuchs-Rosenthal counting chamber

makes a quantitative determination of the increase possible. This has been of inestimable value in the diagnosis of doubtful cases. It has been demonstrated that there is an increase in the protein and globulin content of the spinal fluid in general paresis. We also know that while the blood-serum of cases of syphilis gives a positive Wassermann reaction, cases of general paresis give in addition a positive reaction with the spinal fluid. This affords us an important means of differential diagnosis between general paresis and brain syphilis which sometimes closely simulates it. The diagnosis of general paresis can now be definitely made antemortem by laboratory methods and its existence absolutely confirmed by post-mortem studies of the brain. The researches of Nissl and Alzheimer have also given us a knowledge of the pathology of cerebral syphilis. The Wassermann reaction has shown that general paresis is a parasyphilitic disease. The treponema pallidum, however, has not as yet been demonstrated in the cortex, the meninges, or spinal fluid in that disease. It is an interesting fact that the pathology of the brain in some cases of sleeping sickness, a form of trypanosome infection, is almost identical with that of general paresis. Both diseases give a positive Wassermann reaction and both are due to pathogenic protozoa. The pathology of other mental diseases is not so definitely understood. The general brain atrophy, the neuroglia proliferation, the presence of corpora amylacea, and an alteration in the neurones known as pigmentary degeneration, together with the so-called pinpoint foci of necrosis in the cortex, furnish us with a definite pathology of senile psychoses. Further than this, elaborate studies of arteriosclerotic and other organic diseases of the brain have greatly advanced our knowledge of pathology. Alzheimer's recent studies of the pathology of epilepsy, although not so well known, are well worthy of mention here. Careful studies of the cortex have also been made in imbecility and idiocy.

One of the results of Kræpelin's work has been largely to destroy the integrity of the psychosis known for many years as paranoia. Many of these cases are now looked upon as being paranoid (paranoia-like) types of dementia præcox, alcoholism, and senility; the percentage of actual cases of paranoia which was quite high formerly being now very largely reduced. Several new types of diseases have been added to our classification. One of the more important of these is known as Korsakow's disease, an alcoholic psychosis described in 1887 characterized mentally by profound amnesia with a peculiar tendency towards falsification of memory and fabrications, complete loss of orientation, and physically by pronounced polyneuritic symptoms. Adolf Meyer, in an article in *Brain* in 1901, called the attention of the profession to the importance of a terminal condition to which he gave the name central neuritis. This occurs in infective and exhaustive cases, in melancholia, dementia præcox, senile and other psychoses. It is characterized by a slight rise of temperature, progressive weakness, muscular tension and rigidity, inco-ordina-

tion, muscular twitchings, jactitations, a persistent diarrhea, profound exhaustion, and by a mild delirium or stuporous mental condition. There is a very characteristic lesion known as axonal alteration in the cells of the motor cortex. About 50 cases have been recorded.

Hysteria has been a subject of much study of late. In 1907 Janet at the Amsterdam conference described hysteria as a purely mental disturbance which he defines as "a form of mental depression characterized by the retraction of the field of personal consciousness and by the tendency to the dissociation and emancipation of ideas which by their synthesis constitute the personality." He believes the hypnotic state to be synonymous with hysterical somnambulism and both based on suggestibility. The cause he states as a "depression or exhaustion of the higher mental function with retraction of the field of personal consciousness and dissociation of ideas and functions." A characteristic feature of the disease is somnambulism or dream-like states in which the patient represents in reality another personality, oblivious to all outside influences and centred in his dreams. After this period there is a complete amnesia for all that has occurred. Somnambulistic states characterized by some one predominating idea he speaks of as "fugues." Double or multiple personalities are only protracted somnambulistic states, the characteristic feature being amnesia. To Janet, also, we are indebted for a description of the condition which he first termed "psychasthenia." This he describes as a disturbance of the feelings, the will and the perception. He includes obsessions, manias of doubt, tics, agitations, phobias, impulsions, the deliria of contact, states of anxiousness, neurasthenia, sensations of strangeness, and depersonalization. Psychasthenia has been defined by Meyer as "a lowering of general interest and tendency to rumination over what is accessible to the patient in his memory, but is not squarely met, and where the normal reaction is replaced by rumination, substitute acts and panics." This symptom complex includes many of the so-called borderland psychoses, seems to be based on fundamental features common to all such cases, and apparently has come to stay.

Perhaps no other form of insanity has attracted so much interest as dementia præcox or excited so much discussion. Kræpelin applied the name to certain types which presented characteristic symptoms, complexes usually resulting in dementia. Ziehen applied the name only to those cases showing evidence of actual deterioration. Bleuler describes the disease as being of organic origin with secondary features explained by the psychological studies of Freud and Jung, while the latter explains its features on a purely psychological basis. Adolf Meyer, before the British Medical Association in 1906, called attention to the underlying psychogenic etiology of the disease. He sees in the onset a culmination of an extended period of bad mental hygiene developing in individuals who are unable to adjust themselves to their surroundings. As a result of a perverted mental mechanism they are unable properly to meet the difficulties

of life. In the words of Campbell, "they are apt to brood over their troubles, to see meanings that are not intended, to neglect the ordinary balancing factors of a healthy life, beneath their ordinary daily activity there is usually a variety of internal discrepancies quite incompatible with that feeling of satisfaction which goes with good bodily and mental health." Analytical studies of the inner life of these individuals uncover disturbing factors which have resulted in faulty psychological reactions. This conception of the disease is an intensely practical one and suggests a modification and reconstruction of the mental habits of the incipient cases which may lead to an ultimate cure. Hoch, who has made elaborate studies of these individuals, finds that they are usually of what he terms a "shut-in" type, seclusive and introspective but subject to guidance and control under proper influences. We have here the suggestion of a new hygienic treatment of insanity which is destined, it is hoped, to accomplish much. If the mental habits and the surroundings of an individual are largely responsible for the onset of a psychosis we can look forward to accomplishments which may rival the success attained in the crusade against tuberculosis. This is the highest achievement of modern psychiatry and promises to give it a place with the other departments of medical science in the development of preventive medicine. It is worthy of note here that an effort in this direction has been made recently by the State Charities Aid Association. Not only have our ideas regarding the fundamental principles underlying the conception of insanity changed, but our ideas as to treatment as well. Attention has frequently been called to the fact that Pinel removed the chains and shackles from the insane. This is true and has often been pointed to with pride. Although Pinel removed the chains he did not abolish the use of restraint; and strait-jackets, strong sheets, wristlets, cuffs, straps, and other forms of mechanical restraint have been in vogue for centuries. It is only within the last decade or two that these methods have almost entirely been replaced by hydrotherapy and more humane and scientific methods of treatment. It would be highly improper to conclude a review of the recent progress in psychiatry without a reference to the influence of Sigmund Freud's psychological researches, which promise to be far-reaching in their results. His earliest work was done with Breuer in the study of hysteria. They advanced the statement that hysteria is always the result of a psychic trauma of which the patient himself has no recollection, but which lies buried in the subconscious strata of the mind. By means of hypnosis they demonstrated that hysterical symptoms such as anesthesias, paralyses, etc., were but the symbols of such latent memories. The essential mental mechanism here, up to a certain point, is only that common to the normal individual in the process of forgetting a painful or unpleasant experience. An unpleasant incident in a normal individual is disposed of by a reaction in the form of tears, laughter, profanity, anger, revenge, hate or some expression of speech, which affords an

emotional outlet of some kind. In hysteria, however, we have, according to Freud, a psychic trauma which has not been sufficiently reacted to. The pathogenic idea being a painful one and one which cannot be normally disposed of is rejected by the psychic censor and repressed into the subconscious, intentionally forgotten, but until it is reacted to in some way is not permanently disposed of and a compromise results. A memory symbol in the form of a paralysis or some other hysterical symptom replaces it, while the painful effect or emotion which accompanied it and caused its repression is forgotten. The relation between the memory symbol and the original etiological painful idea is usually clearly established by hypnotism. They found further that when the painful idea or experience which caused this disturbance was recalled to the individual and thoroughly discussed, the hysterical symptoms permanently disappeared.

An extended study of these psychic traumas led Freud to the belief that they always originated in connection with some painful sexual experience in the early life of the individual. Hysteria is thus the result of a conflict between the libido or sexual desire and the normal tendency towards repression of an idea which the psychic censor rejects as incompatible with ideas of propriety or morality. Hypnotism not always being a practical procedure, Freud substituted psychoanalysis. In the execution of this method what Campbell aptly describes as a "scientific confessional" is resorted to. The patient is requested to give a careful account of his troubles with the object in view of recalling the repressed painful experience. In carrying out this idea the patient relates the apparently irrelevant and senseless memories recalled, and these are frequently found to mask the real trouble.

Jung has adapted the association test as originally suggested by Sœmmer to the study of the subconscious. This is based on the fact that certain words or ideas in the mind of the average normal individual suggest certain other words or ideas in the great majority of cases. A stimulous word is mentioned, and the first word suggested constitutes the reaction word. The length of time intervening is spoken of as the reaction time. Freud found that when a peculiar reaction word was obtained, one that differed widely from that usually resulting or obtained only after great delay, it usually pointed towards some so-called complex. The peculiarity or the delay in the reaction was found to be due to the fact that it recalled some painful or repressed idea. He was thus often led to the discovery of the psychic trauma which caused the hysterical symptoms.

Freud found another important method of uncovering the subconscious in the study of dreams. He describes a dream as always being "the more or less disguised fulfilment of a suppressed wish." Even in dreams the psychic censor is active and we have two different activities in dream life, the latent and the manifest ideas. The manifest are those which are recalled on waking while the latent are those which are repressed and for-

gotten. The latent thoughts give the clue to the repressed wish. The importance of the dream lies in the fact that it represents the innermost thoughts of the personality. He divides dreams into three classes:—

(1) Those which represent an unexpressed wish as fulfilled.

(2) Those which represent the realization of a repressed wish in an entirely concealed form, and

(3) Those which represent the realization of a repressed wish in a form insufficiently or only partly concealed.

Dreams accompanied by fear are of sexual nature. In neurotic individuals the dream very often refers to the origin of the neurosis, the repressed painful idea, but owing to distortions, symbolizations and substitutions is not recognized. According to Freud even the "hysterical symptom, like all other psychic formations, is the expression of a wish fulfilment."

It will be observed that Freud attaches great importance to the sexual. His ideas are fully expressed in his "Three Contributions to the Sex Problem." The point he emphasizes most strongly is that sexual instincts do not develop at puberty but exist from early childhood. Sexual tendencies are certainly manifested before the age of puberty, but few attach such an importance to the sexualism of childhood and infancy. Freud goes so far as to assert that the child sucks his thumb or fingers as an evidence of sexual longings which are first aroused by feeding at the mother's breast. This resulting feeling of satisfaction he construes as an element of the sexual sphere. In the psychoneuroses he believes the symptoms to be substitutes or symbols of repressed sexual longings which are radiated into the bodily sphere by conversion. All of the processes of repression of ideas according to Freud are manifested in the normal individual. In his "Psychopathology of Every-day Life" he follows this same line of reasoning in studying the psychology of the normal mind. He tells us that the ordinary process of forgetting occurrences is not so much a gradual fading of memories or impressions, as it is a repression of unpleasant ideas. He thus explains all of the common lapses of speech in the normal individual as well as the well-known tendency to forget names, etc. His theories are not only applicable to hysteria but have been applied to another important group of psychoneuroses, which he speaks of as *Zwangsneurose* or obsession neuroses. This includes all of the obsessions. These are explained by Freud as follows: A painful idea instead of being converted into a bodily symptom, as in hysteria, is relieved of its accompanying unpleasant emotions by detaching itself from the original cause and associating itself with some substituted and less unpleasant idea. He gives the following illustration. A young woman, who exhibited a great distaste towards reading or even touching books, was found to have read a story that recalled an unpleasant sexual experience which occurred when she was eight years of age and which she had forgotten. Compulsive movements he says are measures which tend to pre-

vent the recurrence in consciousness of unpleasant thoughts which have been repressed. This view throws a new and interesting light on what has been described as psychasthenia and would seem to be a logical explanation of its psychology. The prominence attached by Freud to the sexual brought his teachings into disrepute and they were not given the consideration they deserve until Jung applied his psychological methods to the study of dementia præcox. By means of analytical studies, psychoanalysis and the association test, he demonstrated the fact that the apparently meaningless mannerisms of dementia præcox are symbols or substitutes for complexes, which determine the symptoms of the disease. Complexes are groups of ideas associated with emotional disturbances. These complexes may retain their original character without any transformation. Complexes involving a feeling of deficiency and wounded pride give rise to suspicion and delusions of persecution. Unfulfilled longings may be gratified by being actualized and accomplished in the form of delirium or delusions of grandeur. Symbols and substitutes represent complexes which are antagonistic to the ego, and are therefore transformed and not recognized by the psyche. All of these are distorted manifestations of some repressed complex and can be discovered only by psychoanalysis, the analysis of dreams or by hypnotism. Jung's psychological studies of dementia præcox have, not only resulted in a much clearer conception of that disease, but have demonstrated the importance of psychology in psychiatry generally.

Our knowledge of insanity is far from being complete, but the inactivity of many years has been followed by an awakening which has led to exhaustive studies of mental disease from the standpoint of symptomatology, prognosis, pathology, psychology, and treatment. From each of these viewpoints our conception of psychiatry has entirely changed within the last few years, and the outlook is exceedingly hopeful.

ATYPICAL MASTOIDITIS.

By Edward Bradford Dench, M. D., of New York.

While cases of typical mastoiditis are easily recognized, the atypical cases occur so frequently, that special consideration must naturally be given to cases of this character. The ordinary signs, such as local tenderness, narrowing of the fundus, or profound impairment of hearing, profuse discharge or a sudden cessation of discharge, with increased pain, or, in infants, a continuous elevation of temperature, associated with a profuse or moderate discharge from the ear, and unaccounted for by other conditions, are symptoms which we all recognize as an evidence of a mastoiditis. Unfortunately, however, these symptoms do not occur in a regular sequence, and experience seems to teach us that the presence of any two of these symptoms, may be sufficient to determine the necessity for operative interference, and, in some cases, only one of these symptoms may be present.

During the last four or five years, a large number of cases of atypical mastoiditis have come under my observation. In most of these, the condition characteristic of the process, was the appearance of the fundus of the canal. A pronounced sinking of the upper and posterior wall of the external auditory canal, or sometimes an elevation of the floor of the canal, in cases of considerable duration, has been the most constant symptom of a mastoiditis. Comparison of the lumen of the canal with that of the opposite side is of value in these cases. We are warranted in assuming that the conformation of the external auditory meatus, upon the two sides, will be similar, unless some pathological condition exists. If, then, we can exclude bony growths, or an inflammation of the outer portion of the external auditory canal, that is, a furuncle, any narrowing of the meatus upon one side is strongly suggestive of involvement of the mastoid cells.

In a number of cases, occurring in late adult life, this one sign has been the chief evidence of a mastoiditis. In some of these cases the hearing was profoundly impaired after a history of an acute otitis several months before. The impairment of hearing following an acute otitis, should disappear within a month or six weeks from the inception of the acute symptoms, and any profound impairment of hearing after this time, should make one consider seriously the possibility of involvement of the bony structures, even in the absence of other symptoms. If, added to this, we have a slight sinking of the upper and posterior wall of the canal, close to the drum membrane, and a persistent haziness of the drum

membrane, the impairment of hearing furnishes us a strong confirmative sign of the presence of mastoiditis.

In a number of cases, seen during the past year, a persistent otorrhea was the only evidence of mastoid involvement. A profuse otorrhea, persisting for from four to six weeks from the inception of the acute attack, and properly treated either by primary free incision of the membrana tympani or by late incision, if spontaneous rupture has occurred, followed by irrigation sufficiently frequent to keep the canal cleansed, always means involvement of the mastoid cells. In several cases which have come under my observation during the last eight months, this persistent otorrhea was the chief evidence of involvement of the mastoid. There was absolutely no tenderness in these cases, the temperature was strictly normal, the general condition of the patient was excellent, and a persistent discharge from the ear was the sole symptom, together with a considerable impairment of hearing.

In all of these cases, the simple mastoid operation revealed the cells filled either with pus or with large masses of granulation tissue. In a number of cases, the entire mastoid was completely destroyed, being converted into a large cavity filled with grayish granulation tissue, adherent to the sinus and cerebellar dura. In all of these cases a simple mastoid operation was sufficient to clear up the condition.

In certain other cases, there was a history of an acute otitis, of very moderate severity, several months before the patient came under observation.

In the above cases, the only symptom was profound impairment of hearing, a sinking at the fundus of the canal, and slight or absolutely no aural discharge. In these cases extensive destruction of the mastoid cells, in some instances, with fluid pus present, in others with the cells filled with granulation tissue, was found.

Another interesting series of cases has been observed in which, following a comparatively mild attack of acute otitis, with very little subsequent pain, a spontaneous cortical perforation had occurred at an unusual site, that is, on the posterior wall of the external auditory meatus. These cases very frequently simulate furunculosis of the canal. On three occasions, during the past five or six months, I have seen patients presenting this symptom, in which a differential diagnosis between a furuncle of the external auditory meatus, and a perforation on the posterior wall of the external auditory canal, due to mastoid involvement, had to be made. In one of these cases, the presence of a sinus, admitting a small probe to the depth of half an inch, rendered the diagnosis fairly certain. In this case, also, the presence of *streptococcus capsulatus* in the discharge, accounted for the lack of tenderness over the mastoid, and for the insidious character of the involvement. In another case, a smear showed a *streptococcus* infection, which made the diagnosis fairly clear.

In some of these doubtful cases, in which a narrowing at the entrance

of the canal made diagnosis uncertain, an *x*-ray plate of the mastoid has shown either a cloudiness of the mastoid cells, or, in one instance, practically a complete obliteration of the mastoid spaces by granulation tissue. In one of these cases, in which the *x*-ray plate seemed at first to be negative, it was found on a closer examination of the plate, after operation, that two small dark areas,—one over the sinus, and one far back in the mastoid region, near the emissary vein,—marked the exact location of granulation tissue at the time of the operation.

In doubtful cases, I have had *x*-ray plates made in a number of instances, and in practically all cases, we have found evidence of mastoid involvement in the *x*-ray pictures. I think, therefore, we have in the *x*-ray photograph a valuable means of confirming our suspicions in doubtful cases. We have not, as yet, experimented sufficiently along this line to be absolutely certain of the diagnostic value of this measure. In doubtful cases, where it has been employed however, it has certainly been of great value.

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CHRONIC RELAPSING GONORRHEA AND THE METHODS USED TO DETERMINE ITS CURE.

By CHARLES M. WHITNEY, M. D., of Boston,
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The ordinary manifestations of acute gonorrhea are familiar to every physician. As it becomes chronic and intractable the varied pathological conditions which cause it are not as well understood, and the results of treatment are therefore unsatisfactory to both physician and patient in many instances.

The writer desires to call attention most strongly to the important fact that chronic gonorrhea assumes two forms: the chronic continuous and the chronic relapsing; the former, a perfectly obvious condition observed easily by the patient or physician; the latter, most deceptive and dangerous because it may exist without discharge, without shreds in the urine, and without any obvious objective symptoms whatever. Yet with no apparent reason in these cases the discharge returns in an acute form, as capable of spreading the infection as it was at its onset, perhaps years before. If a patient has been unfortunate enough to have married during the interval, when he supposed himself to be cured, the sad results are far-reaching in their effects. Serious operations involving perhaps the removal of both Fallopian tubes, with sterility, as its best result and death from peritonitis as its worst; gonorrheal ophthalmia of the new-born with possible blindness of one or both eyes; the intense mental anguish of a man who has perhaps been the innocent cause of these catastrophes, make up the dreadful sum total of what may happen from this insidious enemy,—the relapsing form of chronic gonorrhea.

That these possibilities are not by any means unlikely or exceedingly rare is shown by the following cases, and also by the fact, to be later mentioned, that many patients who were supposed, from the absence of symptoms, to be cured showed an active growth of gonococci upon the culture medium.

Case I.—A young man, now thirty years of age, was infected with gonorrhea at the age of nineteen, which developed into a slight chronic discharge, for which he was treated by a specialist for a year and a half. He was told to wait six months and then report. This he did, and at this visit the specialist requested him to pass his urine in a glass, and, calling his attention to its clearness and freedom from shreds, told him to go ahead and marry. Acting on this advice he was married a few months afterwards.

There was no apparent discharge and the first child was born at the end of a year. Thus far no trouble had appeared in mother, child, or himself.

Two years later a second child was born and this one had marked gonorrheal ophthalmia of both eyes, which did not destroy the sight because its nature was at once recognized and vigorous treatment instituted. No symptoms of gonorrhea showed in the father or mother, except that the latter showed a slightly increased vaginal discharge during the last months of pregnancy.

Since then there have been no further symptoms of the disease in either parent.

This case well shows that something more is demanded from the physician than an ocular inspection of the urine. The time has now arrived when it is criminally careless for the physician not to use every scientific means to ascertain whether this disease is cured or not before he assumes the dreadful responsibility of exposing innocent wives and children to its dire effects. If this is done we will have fewer invalids and sterile women and blind babies.

Case II.—Frank K., twenty-eight years old, married, reported at the genito-urinary clinic of the Boston Dispensary on November 20th, 1910, with the following history. First gonorrhea nine years before, which lasted seven months and was apparently cured. Second gonorrhea, two and a half years ago, lasted for several months and then as he had no discharge for a year and a clear urine he supposed himself well. To be on the safe side he consulted two physicians, who assured him that there was no evidence of the presence of the disease and that it would be safe to marry.

This he did and within a very short time the disease relapsed, due to excessive coitus possibly. His wife was infected in an acute form and the baby was born with gonorrheal ophthalmia which destroyed the sight of one eye. Soon after the birth of the child the mother was taken to the hospital where a pus tube and ovary were removed. There had been no extra-marital coitus in this case. At the time of the visit he had a profuse purulent discharge, which contained many extra- and intra-cellular diplococci. This man, therefore, had what was practically an acute gonorrhea, starting from an uncured case which had remained latent more than a year.

Case III.—Charles X., twenty-four years of age, consulted the writer in June, 1892. He had had gonorrhea two years previous to his visit, but had been free from all symptoms for one year. Three weeks prior to his visit he was married and the discharge returned in an acute form. Within a few days his wife was infected. He showed a profuse purulent discharge containing many gonococci. Under appropriate remedies this cleared, and an examination of the urethra showed a stricture of calibre 19 F in the anterior portion. An internal urethrotomy was done; the

urethra was fully dilated, and the discharge never returned. An examination of the wife showed a profuse vaginal and urethral discharge, containing gonococci.

The fact that a recent rupture of the hymen was evident, and that the infection was evidently very acute, removed the obvious possibility that the disease had been received from her. As the disease was seen before the days of prostatic massage, no treatment along these lines was given. It shows the influence of recent and contracted strictures in the causation of a relapsing discharge.

Case IV.—M. M., twenty-three years old, consulted the writer on February 6th, 1911. His first gonorrhea was four years before and lasted eight months. He supposed himself well and was married in six months. In six months his discharge returned in a profuse and purulent form with left epididymitis, lasting two months, and was apparently cured by irrigation and by the passage of sounds. A child was born a year after marriage and showed no disease of the eyes. After the first relapse he observed no discharge except a little moisture after drinking beer. Three weeks ago he developed a markedly purulent discharge and, within a week, left epididymitis. At the time of his visit there was a purulent discharge containing many gonococci and his left epididymis and vas deferens were markedly swollen and very tender. Because of the acuteness of the symptoms, no local examination has been made, but it is reasonable to assume that the focus of infection may be found in the vesicles. His wife has a severe leucorrheal discharge, frequent attacks of pelvic pains and attacks of rheumatism which do not yield to remedial means. There had been no extra-marital coitus in this case. The writer recognizes that this report is necessarily incomplete, but its recent occurrence, so well illustrating the subject under consideration, seemed to warrant its inclusion among the illustrative cases.

Case V.—A man of forty-nine, referred to me by the courtesy of Dr. Jonas E. Bacon. His first gonorrhea was contracted twenty-five years before, and became chronic. It was treated for five or six years and the slight remaining watery discharge disappeared by the use of atropine internally. No visible evidence of the disease was present until two years before his visit to me when he had marked frequency of urination with terminal spasm. The urine was very cloudy, but there was no urethral discharge. A culture of the massaged secretion showed gonococci, as did also a slide made at the same time. Following this massage, a sharp attack of left epididymitis occurred. He was treated after the subsidence of the epididymitis by massage, dilatation and instillation, but an examination four months later showed gonococci still present in both slide and culture. For the past year no gonococci have been found and he has had no symptoms. Examination shows a clear urine with no shreds. A 28 sound passes easily to the bladder. By the Swinburne urethroscope the urethra was found to be normal with possibly a slight congestion of

the prostatic portion. There was no residual urine in the bladder, prostate was normal, vesicles slightly enlarged; most marked on the left. Three cultures of massaged secretion showed no gonococci.

This case is most remarkable because it shows the presence of gonococci twenty-three years after the disease had been contracted and eighteen years after the disappearance of all symptoms.

Many other such cases have been seen by the writer in his private and dispensary practice during the past twenty-two years, but further repetition of the essential facts is needless and does not strengthen the case. That they occur is shown by the records of every hospital in which pelvic surgery in the female is done, and it is absurd to suppose that all these cases of pus tubes in married women are caused by the post-marital sins of the husbands, and it is equally absurd to say that a man would marry when there was any visible evidence of the disease. Therefore, they must be caused by a hidden gonorrhea which gives no external signs of its presence until some exciting cause brings on a relapse.

A fact, perhaps not so well known, is that the symptoms produced by infection from a very chronic case may not be as violent as when acquired from a recent case and therefore not as quickly recognized and treated. As a result, a gradual extension to the uterus and tube takes place producing the common gonorrheal endometritis and salpingitis, without any recognized active vaginal or urethral symptoms. In fact, infection of the female urethra is the exception in these cases.

The same difference in severity of symptoms is observed in the eyes, those acquired from a chronic gleet being far less severe.

To outline the pathological conditions which cause the chronicity of this disease, to indicate the modern methods of treatment for its relief, and above all to describe the means of ascertaining when it is cured, are the objects of this paper. Special emphasis will be placed upon the examination by culture of the material obtained by prostatic massage and vesicular strippings.

Diagnosis.

In order to bring about a cure of this ailment it is necessary for us to ascertain from what part is originates, or we are quite unable to apply the treatment intelligently or effectively.

A careful history of previous attacks should be obtained, as well as of other venereal diseases. The question of previous sexual excesses is important as the gonococci may be implanted in a prostate already mildly inflamed from other causes. Complications, which have occurred, are important to note; if the patient, for instance, has had one or two attacks of epididymitis one can be sure that the vesicle did not escape and may now contain the focus of infection. Attacks of frequent urination with terminal spasms or hematuria show involvement of the posterior

urethra or prostate. The freedom of urination, the size of the stream, incontinence or retention, should all be noted.

We are now ready for the examination of the patient himself and the penis should be inspected for the presence of visible discharge. If present it should be smeared on a slide and fixed by heat for future inspection. Examination of the urine is the next logical step in our investigation. From the days of Thompson till to-day, it has been traditional to ask the patient to urinate in two glasses and then to compare the contents of these. This is of value in acute or subacute cases where there is sufficient discharge to flow back into the bladder and thus cloud the urine from its pus content, but to use it in the average chronic case and expect it to yield valuable results is as absurd as it is useless.

In these chronic cases we do not commonly have a profuse discharge, but merely a small amount lying upon the surface of the urethra; therefore, it does not enter the bladder at all. The first glass then will contain all the material which has been washed out of the whole urethra, both anterior and posterior, and does not in the least give us any information as to whether it came from in front of or behind the compressor urethræ muscle: the point of division between these two portions.

The exception to this, as I have already stated, is in those cases of profuse chronic discharge, when the pus has become mixed with bladder urine. Such cases are self-evident general infections. But the test for localization depends upon certain floating particles in the urine, the so-called shreds, and in finding out in what part of the urethra they are found in greatest number. We must substitute for the venerable and respective two-glass-test a more recent and accurate method,—the four-glass-test.

To wash out that portion of the urethra in front of the compressor muscle, we should use a 2 per cent. solution of boric acid, or normal salt solution, and should select a large hand syringe or gravity apparatus in which to use it.

With a rapid and rather forcible dilation of the urethra to insure a sharp contraction of the muscle, the anterior portion should be well flushed out with eight to twelve ounces of fluid. This should be placed in a receptacle and labeled "glass one," representing the washings of the anterior urethra.

The patient now urinates in two glasses, the first of which (glass two) will represent the urinary washings from the posterior urethra, while the second (glass three) the bladder urine and whatever material it may contain.

If empty, the bladder should now be filled with boric acid solution and the prostate and vesicles should be thoroughly massaged. As this solution is passed (glass four), it represents what has been expressed by massage.

This test is not of very great value, but such usefulness as it has depends upon the accuracy with which it is carried out.

Our next step should be carefully to inspect the genitals, to palpate the testes and epididymes to see if any nodules are present as evidence of previous and perhaps forgotten attacks of inflammation, and to examine for varicocele or small hydroceles.

This done we should proceed to our examination of the urethra to see whether there is present that most frequent cause of chronic discharge,—a narrowing of its calibre in one or several points, producing a urethral stricture. For this purpose the bulb-pointed bougie is used,—the *bougie-a-boule* as it is called, and the largest size which the meatus will admit is to be selected, and passed gradually and slowly down the canal to the bulb. If obstruction is met with at any point through which the size selected will not go, the next smallest should be tried, and so down the list until one is found which will pass.

Note of the calibre and depth of all strictures should be kept as well as their sensitiveness and the bleeding produced. Bearing in mind that the normal calibre of the male urethra is 30 F, and the normal meatus 24 or 26 F, we may be reasonably sure that if a 28 or 30 *bougie-a-boule* passes freely there is no stricture. Any tender spots should be carefully recorded for future urethroscopic examination.

Having thus examined the anterior urethra, we must now determine whether there is a stricture of the deep urethra. For this purpose the urethral sound should be used, beginning with 23 F, and if 28 F passes fairly freely there is no stricture worthy of consideration as a cause of chronic discharge.

In the absence of stricture the urethra may be examined with the urethroscope (about which more will be said later) and the general appearance of the mucous membrane inspected as well as any localized areas.

The prostate and vesicles should be next examined by rectum, and their size, consistency and sensitiveness determined. From many such examinations the fact has been established that both chronic continuous and chronic relapsing discharges are due to three chief causes,—urethral stricture, chronic vesiculitis and prostatitis. Other contributory conditions may also be present,—cowperitis, folliculitis, as well as general urethral inflammation, but they are usually of secondary importance. Chronic infection of the epididymes and vasa deferentia may be a causative factor in certain cases.

Treatment.

This must be varied to meet the various conditions presenting themselves at the time the patient consults us.

If a profuse purulent discharge is present it should be first examined for organisms, and if they are found no local examination should be made until we cause the discharge to become less or at least free from gonococci.

For this purpose we should use the ten-minim-capsule of sandalwood oil, taking care to prescribe a reliable preparation on account of the frequent adulteration of this drug. Four of these should be taken daily. Locally the injection three or four times daily of 4 per cent. argyrol, 1 per cent. novargan or ½ per cent. protargol. The discharge ceasing temporarily under this treatment, we may proceed to our examination as above outlined.

As these two causes of chronic discharge are responsible for the largest number of such cases, the two general principles of treatment should be a thorough dilatation of the urethra and frequent and persistent vesicular strippings and massage of the prostate.

First, as to the urethral dilatation: For this purpose there are three instruments,—the flexible bougie, the curved urethral sound and the Kollmann dilator, each of which has its value in the varying conditions which may be present. If the stricture is less than 20 F in calibre it is a safe rule to use a flexible bougie. The tissues about a stricture are usually soft and easily injured by a rigid instrument like a small sound, and through the laceration thus produced pathogenic organisms may enter the circulation. Severe chills and other symptoms of septic infection—the so-called urethral fever—may ensue. Such cases have been seen by every genito-urinary surgeon, and while they may be mild they may also be severe and cause death. The three following cases well illustrate the latter.

Case VI.—A man of forty-two, seen in consultation with a medical colleague had long been the subject of a deep urethral stricture which had been treated by external urethrotomy several years before. From his own neglect it had closed down and was causing a slight urethral discharge and moderate difficulty in urinating. Dilatation was attempted with an 18 F sound which passed with some difficulty, and was followed by considerable blood. No force was used by the physician. The following day he had a sharp chill with a temperature of 103° F. These repeatedly occurred and in spite of constant treatment assumed a chronic form with a chart of septicemia. He gradually failed, the chills were of daily occurrence and were followed by profuse perspiration and weakness of the heart action. A large slough, more than eight inches in diameter, formed in the sacral region under which could be seen the sacrum. Death occurred in eleven weeks after the sound was passed. No focus of pus was present but he died from general sepsis.

Case VII.—A man of fifty-two was the subject of a relapsing discharge caused by a stricture of small calibre, usually quite easily dilated by a soft bougie to 14 F. His physician dilated him with a steel sound up to 20 F, and considerable blood followed. The next day he had a marked chill with high fever following it. Mild delirium ensued and death occurred on the fourth day after the sound was passed.

Case VIII.—A man of thirty-four, who had recovered from a chronic

gonorrhea under treatment by sounds and irrigation, was the subject of a spasmodic stricture which required occasional dilatation. The usual size of sounds, 23 and 25 F were passed, and it was noted that the last one went in with some resistance, and that after its withdrawal a little blood followed. He was attacked at 9 p. m. with chills and vomiting for which appropriate treatment was given. He grew rapidly worse, the temperature rose to 104° F, the pulse became rapid, acute delirium set in and he died at four o'clock of the following day,—just twenty-three hours after the sound was passed. The autopsy showed a slight linear tear of the membranous urethra and general septicemia. There was no disease of any organ nor was the patient an alcoholic.

To avoid such disasters as these it is absolutely important that irrigation of some antiseptic solution should invariably be used after any instrumentation in the urethra. For this purpose the writer has used for several years a 1/4,000 solution of nitrate of silver, washing first the anterior urethra and then filling the bladder by gravity or by using a sterile catheter. If this is used even a slight chill is exceedingly rare.

An exception to this rule of using a steel sound below 20 may be found in these resistant strictures of small calibre when dilatation is exceedingly difficult by a soft instrument. Here we should use the small sound which has a thread to which may be attached a filiform bougie which serves as a pathfinder. As the sound readily enters the stricture no laceration results. The writer's perfected instrument, which has been made for him by Eynard of Paris, will be described in another article, but is briefly referred to here to call attention to its great value in such cases.

When the urethra has been dilated to 20 F the conical steel sound should be used.

The technique of using these instruments is known to every physician, but for safety and comfort of the patient three precautions should be used—namely, cleanliness, gentleness, and plenty of time. If these points are always kept in mind there will be less fear on the part of the patient and he will not be so ready to desert the physician as he now is because "he prefers the disease to its remedy." It is always well to use one or two sizes smaller than the one which is really the dilator, for this serves to lubricate the passage and makes the second sound enter very easily. Two sizes only should be used at one sitting.

Should the meatus be too small it can be enlarged by cutting it upon the floor with a small blunt pointed tenotome or eye knife. Ten per cent. solution of cocaine should be applied on a small swab and followed by suprarenal ointment, which stops any bleeding. The writer's short meatome has been found by him to be an exceedingly useful and accurate instrument. To check the hemorrhage suprarenal solution may be used, but most marked and quick hemastatic action has been found by the use of thrombo-kinaise, the ferment developed by Dr. Lawrence W. Strong of the Manhattan Ear, Eye and Throat Hospital, New York.

When the urethra admits readily a 28 to 30 sound it may be considered dilated so far as any stricture is concerned, but it should be kept in mind that dilatation is not only used for strictures but for other pathological conditions which tend to keep up a chronic discharge. These are an atonic condition of the mucous membrane, infection of one or many follicles, and the involvement of the mucous glands of the prostate. For these the sound does an incalculable amount of good. Where no stricture is present and the region of the prostate only needs dilatation, the Kollmann dilator has its greatest value. This four-bladed dilator with a Guyon curve has a fixed calibre in that portion which rests in the meatus, and it may be used where this is too small to admit large sounds. The rubber cover should be carefully sterilized before using. This instrument has little or no value in the dilatation of strictures, but finds its greatest usefulness in chronic prostatitis. Dilatation should be done two or three times weekly according to the tolerance of the urethra.

When the gonorrheal organisms pass beyond the compressor urethræ muscle and enter the posterior urethra we have many and serious complications. Unfortunately for its victim this happens in from 70 to 80 per cent. of all cases. The reasons for these grave dangers can be seen at once when we recall the anatomy of this region. The urethra here is of large calibre and is surrounded by the prostate gland. On its floor is to be seen, on the middle line, an elevation of varying size, the verumontanum. At its apex there is an opening, the sinus pocularis, or utriculus masculinum as it is sometimes called, in the lateral walls of which are the openings of the ejaculatory ducts. On either side of the verumontanum are the prostatic sinuses into which empty the prostatic ducts.

The ejaculatory ducts are three-fourths of an inch in length and pass through the prostate gland and enter the seminal vesicles on either side. These two organs are of the greatest importance in the causation of chronic gonorrhea, and consist of two lobulated pouches which are attached to the base of the bladder. Behind them is the rectal wall. Each vesicle is about two inches in length and three-fourths of an inch in width, and lies in close proximity to the prostate, forming on either side a slightly obtuse angle to a horizontal line drawn through it.

On section the vesicle is apparently composed of a series of convoluted canals having no general direction, but on careful dissection they are found to have a somewhat pyriform arrangement, the apices ending in the ejaculatory ducts. They consist of three or four large canals into which empty others which end in blind pouches or diverticula. This honey-comb structure, as it may well be called, explains the chronicity of this disease and also the difficulty we find in curing it.

The accompanying photographs from dissections made for me at Tufts College Medical School show most beautifully these points of structure.

The vas deferens enters the vesicle on its inner side at the juncture of

the ejaculatory ducts with which it forms an acute angle. At its lower end it becomes larger, forming the ampulla of Henle separated by a small valve from the cavity of the vesicle.

It can readily be seen that when this disease involves the deep urethra it may extend in several directions, upwards to the bladder and pelves of the kidneys, laterally into the prostatic ducts, and by the ejaculatory ducts to the seminal vesicles, epididymes and testes.

It may also penetrate deeply into the substance of the prostate.

Fig. 1.

Fig. 2.

Fig. 1.—Subacute gonorrheal vesiculitis, Museum Tufts College Medical School.
Fig. 2.—Same specimen with the vesicles laid open showing masses of purulent material.

The treatment for the chronic form of such extension to the prostate and vesicles is dilatation and massage with vesicular stripping. The former we have already considered, which brings us to the latter and most important procedure.

It is to Eugene Fuller that the profession owes much for teaching us the importance of this, as well as the frequency of seminal vesiculitis. Previous to 1893 this method of treatment was practically unknown; to-day it is used over the civilized world and has cured many thousands.

The most common descriptive term which is applied to this form of treatment through the rectum is "prostatic massage," but from this I wish to dissent. It implies that the benefit to be derived comes from its effect upon the prostate, which is not at all the case. If anyone will carefully examine the post-mortem appearance of these two organs he will see that the prostate is about an inch thick and is very firm and resistant in structure. Therefore, it is practically impossible for force applied through the rectum to its posterior surface to affect the inflamed glands in its anterior or urethral surface. This might be done were some solid body, like a sound, in the urethra, but this is obviously impractical and unsafe. Most of the good which is done by this valuable procedure is from its effect upon the vesicles.

In many cases of prostatitis with boggy enlargement of the gland much good is done by massaging it, but this condition is not as frequent as the vesicular involvement.

Fig. 3.
Normal seminal vesicles.

As I have found that this form of massage is not well understood by the average physician whose time is occupied by other lines of work, I consider it worth while to describe it somewhat carefully.

To find a position which is comfortable for the patient and convenient to the operator and yet permits free access to the affected parts is not easy. As a result of many experiments the following has been selected. The patient should remove his outer clothing and should push the trousers down to the ankles. The shirt should also be rolled up as far as the lumbar region. An ordinary stool with an elevation of twenty-two inches should be used and upon this the patient should lean, resting his weight upon the forearm and elbows. The feet should be well apart with the toes about a foot from the stool. The legs should be bent at the knees to relax the muscles as much as possible; and only one who has done massage many times can appreciate how much aid this position is in rendering the vesicles and prostate accessible to the finger. When it is desired

to save the massaged secretion for microscopical examination, the patient can hold with one hand a small Petri glass below the end of the penis.

The operator should always wear a rubber glove which should be well lubricated, as should also the external surface of the skin about the anus, which renders the introduction of the finger very much easier.

Standing at the patient's left the operator should place his left hand over the pubes and gently insert the index finger of the right through the anus into the rectum. As this is entered there is felt directly in front the rounded posterior edge of the prostate with the depression between the two lobes. As his finger becomes trained he will soon feel on either

Fig. 4.

Large mucoid mass expelled by vesicular stripping.

side the soft masses of the vesicles extending in an upward and outward direction for an inch and a half to two inches. In fat subjects the thickness of the perineum prevents palpation of the upper ends of these, but in most cases it is easily done. One should proceed in a methodical manner in carrying out this procedure, remembering that the object is to gently press upon the vesicles to expel their contents, and also to do what is possible in the way of massaging the prostate. Therefore, it is well to begin upon the right side and reaching up as far as possible to bring the finger down to the median line of the prostate. The next movement should be a little more to the left and so on until the whole right side has been treated. The left side should be similarly gone over.

The movement to be used is a combination of flexion and pressure of the first joint of the finger, the latter of which can be increased as the condition of the tissues permits. It should be done very gently at first because the patient fears it, since it is new to him, and because there is a possibility always present of starting up an attack of acute epididymitis.

About fifteen of these gentle movements should be used and they can be increased to about eighty or even more later.

The bladder should be full of urine or boric acid solution. I think well of the suggestion of my colleague, Dr. Henry J. Perry, that before the massage the patient should pass about two inches of urine in a glass. This is saved for comparison with the urine passed after massage. A frequent and annoying feature of these cases is the inability to urinate after massage, due to reflex nervous influences, but by allowing the patient to be by himself a few minutes this is usually overcome. Most patients after a few treatments will do all right in this direction. The material which is expressed may be in large amounts so that it drops freely from the meatus, but in others nothing at all appears; and between these two extremes we find all grades. This expressed material should be saved on a slide or Petri glass as before advised.

When the urine is passed into a glass we find the same marked differences in the material which it contains. The most striking result is the appearance of many large white flakes which sink quickly to the bottom. These are almost pathognomonic of a vesiculitis.

Again we notice large mucoid strings which remain suspended in the urine or solution for a long time. One of the most striking examples was seen at the genito-urinary clinic in November, 1910.

Case IX.—Italian, thirty-four years old, appeared at the Boston Dispensary for the treatment of his chronic gonorrhea which had existed for a year. As he passed his urine in two glasses for quick comparison it was noted that the first was fairly clear but the second was very cloudy. As this indicated that the muscular effort of emptying the bladder apparently squeezed out purulent secretion from somewhere, an examination of his vesicles was made, and a very large amount of a ropy mucoid material was expressed, which is very well shown in the photograph here produced which was taken half an hour afterward and shows the suspension of these masses still present. Several massages at different times yielded similar results.

The urine after massage usually has an opalescent appearance whether any material is present or not. After several treatments the flakes disappear and all that may be found in the urine is occasional shreds of varying size. The presence of a white fluid at the meatus is of no significance whatever, for it may be normal prostatic and vesicular secretion. The microscopical examination and cultures of this are, however, matters of the greatest importance and should be done in every case.

Irrigation.

After both dilatation and massage the urethra and bladder should be irrigated. For this purpose nitrate of silver 1/4,000, permanganate of potash 1/3,000, or 4 per cent. solution of boric acid may be used. Of these the silver is best for the average case. Where there are other organisms present, as in cases of stricture, the oxycyanide of mercury 1/4,000, is invaluable, but it is useless in cases of gonorrheal inflammation alone.

We may irrigate the urethra and bladder in one of three ways,—by the gravity method, by the hand syringe, or by the catheter. Each has its advantages in the varying conditions present.

To make quickly a percentage solution, the writer has found it very convenient to have stock bottles on hand which may be diluted as required. For example: a solution of nitrate of silver made with 7.29 grains of silver to a drachm of water, permanganate of potassium 7.29 grains to two drachms, and of oxycyanide of mercury 7.29 grains to three drachms of water. The variations are because of the varying solubility of the three. To make the weaker solution for irrigating, one, two or three drachms, according to the one desired, may be added to 500 c.c. or one pint of water and this makes a solution of 1/1000.

Sol. Nitrate of — Silver	Sol Potassium Permanganate	Sol. Oxycyanide of Mercury	
3ɬ (7.29 Grs.)	3ɪɪ (7.29 Grs.)	3ɪɪɪ (7.29 Grs.)	To 500 c.c. (Oɬ) = 1-1000.
" "	" "	" "	" 1000 cc. (Oɪɪ) = 1-2000
" "	" "	" "	" 1500 cc. (Oɪɪɪ) = 1-3000
" "	" "	" "	" 2000 c.c. (Oɪv) = 1-4000
" "	" "	" "	" 2500 cc. (Ov) = 1-5000
" "	" "	" "	" 3000 cc. (Oɪ) = 1-6000
233.28 Grs To - 4-Ozs.	Do to 8 Ozs.	Do. to 12 Ozs.	

This table makes the subject perhaps clearer and is useful for office work. Some years ago I used a solution of iodine for irrigation and have recently made careful investigation along this line.

It is too soon to say just what strengths are best for different cases, but I am sure that this method has a great future in chronic prostatitis, both as an irrigation and for instillation. It is usually well borne and future experiments will be made to ascertain just what strengths are required in the various conditions.

Churchill's tincture in weak solution is the form which I am now using.

Instillation.

Where a stronger and more local action is desired nitrate of silver in 1, 2, or occasionally 3 per cent. solution may be applied to the posterior urethra by the Keyes-Ultzmann deep urethral syringe. Ten to twenty drops may be used. Marked frequency of urination with vesical tenesmus results at once and lasts about an hour. Occasionally blood follows the use of the stronger solution. The patient should be told that these symptoms will result. Sterling silver tubes should be used and cheap syringes avoided as they decompose the solution and cause endless trouble.

Urethroscopy.

In certain cases of infected follicles and in localized areas of chronic urethritis marked benefit is derived from the direct application of solution of nitrate of silver in strength of 20 to 60 grains to the ounce. By the urethroscopic tube, which has a small electric lamp fitting into a sub-tube in its lower surface, we are able to bring the whole urethra under inspection. If it is desired to examine the deep urethra, the Swinburne curved prostatic instrument works very well indeed.

Occasionally the open mouths of these follicles may require cauterization by the galvano-cautery or incision by a small Kollmann knife. A chronic folliculitis with repeated abscess formation is a well-recognized cause of chronic relapsing gonorrhea and should be removed by careful dissection when present.

A chronic inflammation of Cowper's glands is a condition which is more generally present than is usually described, and often ends in abscess formation. These small glands are situated in the folds of the compressor urethræ muscle and open on the floor of the bulbous urethra by a small duct one and a half inches in length.

After a course of treatment the question arises, is the patient well? To answer this question it is necessary to apply certain tests and see if we can find gonococci. The first and most obvious is to examine for visible discharge. If present it should be viewed with suspicion even if it is only mucous. If purulent, even without gonococci, further active treatment should be carried out. If no visible discharge can be found we may permit the patient to drink beer and other alcoholic drinks and watch for relapses. If the patient has coitus he should use a rubber condom to avoid re-infection from other sources, or infecting others. If no discharge follows these tests, we should now excite a chemical discharge by the use of an irrigation of nitrate of silver 1/3,000, and the instillation of 1 per cent. solution of the same. Previous to these a full-sized sound should be passed to distend the urethra and open the mouth of the follicles. The discharge resulting should be examined microscopically with great care. This provocative method should invariably be used.

The urine must be free from shreds containing a large amount of pus. Those of mucus or epithelium have usually no significance.

The prostatic and vesicular secretions should be expressed by massage and examined.

Having found nothing to indicate the presence of gonococci thus far we should now proceed to make our final test, the examination of the expressed vesicular and prostatic material by culture.

The writer is under the greatest obligation to his colleague, Dr. A. C. Pearce, for his patient and careful investigation during the past three years, and the larger portion of this description of our methods is from his records.

The discovery of the gonococcus by Neisser in 1879 was the first step in unravelling many obscure conditions which are now recognized as direct extension or metastatic infections due to the gonococcus.

The next step in advance was made by the discovery of a suitable culture medium by Bumm in 1887. Since that time a vast amount of work has been done on the gonococcus by various observers all over the world. Many statistics have been compiled by urologists and gynecologists in reference to the prevalence of gonorrhea and the length of time the gonococcus may lie dormant in the genito-urinary tract without giving rise to any symptoms.

We therefore accept as proven that gonorrhea is responsible for 40 per cent. of all cases of blindness in this country, 80 per cent. of gynecological operations, and that 60 per cent. of infected women; and a large percentage of infected men are sterile. Sexual neurasthenia and impotence are of common occurrence and result directly from chronic gonorrhea. These statistics can be greatly lessened in the future if gonorrheal patients are made to realize the dangers of latent gonococci and precise methods of examination for the presence of the gonococcus are followed in every case.

The difficulty of detecting hidden gonococci is due to the complex anatomical structures involved, the fact that gonococci may lie quiescent for months or even years without giving rise to any symptoms, and the difficulty of reaching their hiding places in the glands of Littré, Morgagni, Cowper, in the prostate, the epididymis, the vas deferens and ejaculatory ducts.

Another difficulty in detecting gonococci is met in the variable cultural characteristics. Three years ago we undertook to cultivate the gonococcus from the urine and massaged secretion of the seminal vesicle and prostate gland, using essentially the method laid down by Young of Baltimore. The cases were taken from private practice. The difficulty of obtaining suitable culture media has yet to be solved, *i. e.*, a medium that will grow the gonococcus under varying conditions. From time to time various mediæ have been recommended, among them being Lœffler's blood-serum, hydrocele agar, ascitic fluid agar, chest fluid agar, Marmorek's human blood-serum and Guanieri's solidified blood-serum.

When it is desired to cultivate the gonococcus on a large scale it is

easy to realize that human blood-serum cannot be used although it is the most satisfactory. The problem was finally solved by using rabbit's blood to furnish the albumin content. The blood was obtained in a 30 c.c. syringe with a long needle, such as is used in tapping veins in the forearm, and doing a cardiac puncture, which does not disturb the rabbit in the least. A fair-sized rabbit will yield 60 c.c. of blood without any ill effects. This blood is mixed in the proportion of one part blood to two parts nutrient agar. The nutrient agar was prepared by extracting one pound of lean beef by immersion in 500 c.c. of cold water for twenty-four hours, then bringing it to a boil and skimming the surface. Then 40 grams of agar were added, 10 grams gelatin, 20 grams peptone, 3 grams sodium chloride and 1 litre of water. Titrate 8/10 per cent. acid to phenolphthalein.

The growth of the gonococcus even on the most carefully prepared media is uncertain because of its slight vitality outside of the human body. It is easily destroyed by the slightest variation in temperature, even one or two degrees being sufficient to kill it. Some strains grow almost luxuriantly, others not at all. This has led some observers, as Torrey and Teague, to believe that the gonococcus species is made up of several races and may be divided into several different types.

Watabiki (Tokio) in his studies on carbohydrate media could not get the same results and does not think gonococci are of different types. Maltschonoff, Bruckner, Oppenheim and others in their studies upon gonococci and agglutination, precipitation and complement binding method, are not ready to accept the existence of differential characters, or types, of the gonococcus.

Watabiki uses a medium composed of peptone 10 grams, sodii chloride 5 grams, aq. distil. 1,000 c.c., to which he adds equal parts of horse serum.

Rabbit's blood, ascitic fluid, human blood-serum and Robert's blood-serum were used in this series of cases to furnish the albumin for the culture media. Hydrocele fluid has proved unsatisfactory in our hands.

All media should first be tested by planting with fresh gonorrheal pus, as growing the gonococcus from a fresh case with profuse discharge is a simple matter compared to cultivating the gonococcus from strippings obtained by massage from the vesicles and prostate. The obstacles in cultivating the gonococcus in the latter cases are due to the difficulty of obtaining sufficient material to work with, contamination from the urethra in spite of every precaution taken, and the slight vitality of the gonococcus outside the human body. The rapidity with which contaminating bacteria overgrow the surface of the tube necessitates constant vigilance. We have experimented with the gonococcus in relation to the use of animals as a culture medium.

In our experiments gonorrheal pus did not produce the slightest disturbance in the eyes of rabbits and guinea-pigs. Neisser, Lœffler and others got negative results in inoculating the gonococcus into the eyes, urethra, joints and peritoneum of guinea-pigs, rabbits and dogs. You-

mans claims successful results in inoculating gonorrheal pus into the eyes of guinea-pigs, but his results, to our knowledge, have not been confirmed by other observers. The use of animals to detect hidden gonococci would be of the greatest assistance to the genito-urinary specialist and would be the means of preventing much human misery and many mistakes that are now unavoidable.

In a large number of our examinations we have found it an advantage to use the patient's own blood obtained from the ear and drawn into small test-tubes. This was mixed with the nutrient agar, already described, to which rabbit's blood had not been added.

Routine Examination.

The patient is instructed to hold urine three hours at least before reporting for examination. Any discharge appearing at the meatus is obtained on a slide and cultures on blood agar also made. A thorough washing of the anterior urethra with warm sterile water, at least one gallon, is given. The patient then passes his urine in clean glasses; the urine is then centrifugalized and the contained shreds and pus fixed on a cover-glass and stained for gonococci. The bladder is filled with warm sterile water, the glans penis cleaned with soap and water followed by alcohol, a few drops of which are allowed to enter the meatus, causing a slight temporary burning. The index finger of the physician, being well lubricated, is introduced into the rectum and immediately comes in contact with the prostate. Running off to the right and left the vesicles may be felt.

In order to get the best results in massaging the vesicles it is well to bear in mind the anatomical position and the peculiar honeycomb arrangement of the vesicular pockets. Exert pressure from above downward and inward, making firm but interrupted pressure with the pad of the index finger. The amount of pressure depends upon the conditions found. The massage of the vesicles at times is a very difficult matter as they sometimes extend beyond the reach of the finger. At other times their contained secretion cannot be expressed on account of the unstable anatomical arrangement, or the secretion flows back into the bladder and can only be obtained by passing the wash water. Or there may exist a stenosis of the ejaculatory ducts. Of great assistance at times is pressure of the knuckles or fingers in the perineum on either side of the deep urethra.

Any secretions appearing at the meatus is immediately transferred to the culture media, slides are made, the wash water is passed in sterile centrifuge tubes and centrifugalized, and smears made of the sediment. (In our opinion cultures made from the sediment is a waste of valuable time and material.) The slides are fixed in equal parts of ether and alcohol, or a saturated solution of corrosive sublimate; they are treated with one of the various contrast stains and the Gram decolorization stain is always used for diagnosis. The addition of one drop of acetic acid is helpful in detecting pus corpuscles.

In our series of 170 cases, representing over five hundred separate examinations (as each case was examined at least three times; others many more times), 32 were positive, or 18.2 per cent. Of these 14 showed gonococci by culture, 8 by slide and culture and 10 by slide alone. Of the 14 cases by culture, 10 showed contaminating bacteria, *i. e.*, only 4 showed a pure culture of the gonococcus.

The bacteria found are often of the non-pathogenic variety, but that germs other than the gonococcus are responsible for the persistence of prostatitis and chronic seminal vesiculitis there is no doubt in our minds. Gonorrheal in origin, the non-pathogenic germs constantly found in the urethræ find a most favorable habitat in those organs damaged by the gonococcus and help to keep up the chronic inflammation. We found a long and short bacillus, colon, diplococcus (small) and often a large biscuit-shaped diplococcus larger than the gonococcus, but it did not decolorize; also streptococcus, staphylococcus, pneumococcus and some bacteria which could not be identified.

In the so-called catarrhal discharge, where gonococci are proved to be absent but large numbers of bacteria described as non-pathogenic are found, we believe these bacteria take on a decided pathogenic attitude and become pus producers.

In a study of the normal contents of the seminal vesicles, in which a bacterial examination was made directly from the vesicles within a few hours after death, one showed a large bacillus, three showed no growth, but one of these contained considerable pus.

In determining what constitutes a cure it is not only necessary that the gonococci be proved absent, but also that no pathological condition is left behind. The presence of pus in the vesicular strippings indicates a chronic inflammation which may or may not be due to the gonococcus. As already pointed out, other bacteria than the gonococcus are capable of propagating this condition. Pus in the seminal vesicles and prostatic fluid means a pathological secretion possibly leading to sterility, sexual neurasthenia, loss of sexual power, and probably enlarged prostate. Pus is always suspicious.

This series of cases has taught us that only by persistent and repeated examinations, by injections of silver nitrate, the use of the Kollmann dilator, sounds, alcohol, massage and culture, can we assure the patient that he is well.

Besides these tests we have one of great promise in the complement-fixation test applied to the study of the serum of a patient having gonorrhea. In the article by Schwarts and McNeil in the *American Journal of Medical Sciences* for May, 1911, they prove that a positive reaction is an indication of living gonococci somewhere in the body. They point out that it is of the greatest assistance in making a correct diagnosis in gonorrheal rheumatism and other forms of arthritis or rheumatism.

Gonorrhea is a curable disease; it may take months, rarely years; the difficulty comes in saying when it is cured.

NITROUS OXIDE ANESTHESIA IN ADENOID AND TONSIL OPERATIONS.

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I shall not dwell upon the discovery of nitrous oxide by Priestley in 1772, or its physical or chemical properties for I take it that all are familiar with them.

Nitrous oxide as a general anesthetic is becoming more popular every day with the general surgeon. The one real drawback to its general adoption up to the present time has been the fact that for long operations it requires an expert to administer it, because it takes a varying amount of oxygen for different patients.

In tonsil and adenoid work this factor has fallen away, for the anesthesia demanded is so short that oxygen is unnecessary.

That nitrous-oxide anesthesia is more devoid of danger than any other known form of anesthesia is generally conceded.

Hewitt[1] was able to collect only seventeen authentic deaths over a period of forty years, and when one considers that countless numbers of administrations are never recorded, the death-rate may be said to be infinitesimal.

It has been shown by Van Arsdale[2] that when nitrous oxide is inhaled it is absorbed and carried in the blood-plasma to the brain where it exerts its anesthetic properties through its own inherent action upon the brain.

Hamburger and Ewing[3] have shown that nitrous oxide has no bad effects upon the blood itself. It does not increase hemolysis as does ether. What slight changes do occur during the administration are transitory and within two hours after the anesthetic, examination has shown the blood to be the same as before the operation.

When nitrous oxide is inhaled it sometimes causes mental excitation—which can only last a few seconds, however,—for anesthesia is produced within thirty seconds. The respiration becomes deep, tends to be somewhat more rapid than normal, slightly irregular and is often of a stertorous character. Nitrous oxide stimulates the vasomotor centre, causing a rise in blood-pressure, but has no direct definite action upon the heart. The pulse becomes somewhat more rapid at first, but slows as the anesthetic is continued. The conjunctival and corneal reflexes are lost, the pupils dilate and the eyeballs turn inward or upward and become fixed.

These are the signs of true nitrous oxide anesthesia. In children this

occurs in about twenty seconds. If the pure nitrous oxide is continued beyond this stage, which is unnecessary, the patient becomes cyanosed and jactitation and clonic movements of the extremities set in. These symptoms are the result of the asphyxial element in the administration of this anesthetic.

The cyanosis which takes place cannot be taken as an index of the cardiac or respiratory depression, as it is due to a capillary stasis and insufficient oxygenation of the blood. It clears up under oxygen. A stasis allowed to persist too long will of course tax the right heart beyond the normal. The stasis also causes a swelling of the brain which results in headache. The cyanosis is not due to any condition of the nervous system or heart, and for that reason is not much more dangerous than that caused by a severe coughing spell or an asthmatic attack.

At the Children's Hospital we have the patients rebreathe the gas—that is—have them exhale into the gas bag with the outlet valve of the mask closed. There are several distinct advantages of rebreathing the gas:—

It requires less gas for each narcosis.

It materially shortens the time it takes to produce anesthesia.

Besides these, rebreathing warms the gas in the reservoir which is of distinct disadvantage in so far as warm gas is less irritating to the lungs, so that there is less liability to post-operative bronchitis or pneumonia.

Gatch[4] also says that warm gas has been found to induce anesthesia faster and give more perfect relaxation.

By rebreathing into the bag a certain amount of carbon-dioxide is given off with each expiration, and this is again breathed during the next inspiratory phase, thus increasing the CO_2 content of the blood; and this, if the theory of Henderson be true, is of very great value.

Yandell Henderson,[5] assistant professor of physiology at the Yale Medical School, seems to have proved that shock does not result from over-stimulation of the vagi or from the loss of arterial tension, as has been supposed all along, but from inhibition of metabolism as a result of the pain and the increased respiration which always accompanies pain. Diminished metabolism causes a diminished amount of CO_2 in the blood which Henderson calls acapnia.

Carbon-dioxide, Henderson believes, is the normal stimulant of the venous wall, besides being a respiratory, vasomotor, and cardio-inhibitory stimulant. A reduction of the CO_2 content of the blood causes, as a rule, shallow, feeble respiration, a rapid pulse, and low blood-pressure, while excess of CO_2 causes deepened respiration, slowing of the pulse and increased blood-pressure. Lack of carbon-dioxide in the blood then causes lack of venous tone, and decreased venous tension decreases the amount of blood that reaches the heart. If loss of tone is too great the heart does not fill and ceases beating.

It may be interesting to mention that Henderson in the *American Journal of Physiology* makes the statement that ether hyperpnea is as liable to produce fatal apnea vera as pain hyperpnea; this means that ether given in such a manner as to occasion rapid breathing is as likely to induce shock as intense pain. Crile[6] has shown also in the physiological laboratory that animals under N_2O withstand shock-producing trauma much better than under ether.

If these statements are found to hold in practice and knowing as we do that under N_2O the heart continues to beat after the respiration has ceased from muscular spasm, a result of asphyxia, we must admit that it is not only the safest anesthetic, but also the best anesthetic from a physiological standpoint.

Its other advantages are absence of uncomfortable sensations to the patient, almost immediate recovery from the anesthestic, the absence of lung complications, of danger to the kidneys, liver and heart. Post-anesthetic vomiting is absent and therefore the complications caused by it are absent. .

The after effects are slight—sometimes there is dizziness and headache; these have disappeared, however, since we do not carry the anesthesia into the stage of asphyxia.

In children the anesthetic and symptoms must be watched closely, for children go under very rapidly; in fact, they are often under before they stop crying.

All authors agree that the administration of N_2O is contraindicated in the case of obese plethoric individuals or those having atheromatous arteries, and while some have warned against N_2O in infancy, I have seen no ill effects from it even in very young infants.

The only other contraindication to my mind is in those cases where the status lymphaticus is suspected. I say suspected advisedly, for it is a condition which rarely can be more than surmised during life. But as the condition is most frequent in infancy, often existing without having caused definite symptoms, but nevertheless having caused a hypertrophy of the pharyngeal ring of lymphatic tissue as a part of its pathological course, and in view of the fact that Holt says that "these cases are very imperfectly understood, and are not rare," I can easily imagine cases having undergone operation with no apparent harm. Knowing as we do, that an anesthetic, particularly chloroform, has produced death in this condition, I take it that we have one more good reason for using nitrous oxide, which causes less shock and no constant blood changes, as the anesthetic for routine work.

I have had only one case, this in an adult in a large series where N_2O was unsuccessful; and have seen one other. Ether was then resorted to with success in both cases.

Though the most highly organized centres are easily and speedily af-

fected, relaxation is tardy; this is of little consequence, however, in tonsil and adenoid work, for the rigidity of the masseter muscle is overcome by adjusting the mouth gag before the nitrous oxide is started.

The elimination of nitrous oxide takes place principally through the lungs, and so oxygen may be said to be a specific in asphyxia resulting therefrom.

Strychnine and atropine are said to be therapeutic antidotes. If, however, the contentions of Henderson be true, they are contraindicated. A saturated solution of camphor in olive oil, which is a cerebral stimulant when injected, would seem more valuable in shock resulting from an anesthetic.

Besides the pleasantness and safety of nitrous-oxide anesthesia, a very desirable feature of its narcosis is the fact that the cough reflex is maintained. Irritation, therefore, of the glosso-pharyngeal under this anesthetic, besides inhibiting respiratory movements for a short period of time, allows of gagging. This I have become accustomed to and even prefer, as it helps in keeping the blood from the larynx and gives me the strongly contracted internal pterygoid muscle to manipulate my tonsil upon.

I have discussed the admission of nitrous oxide without oxygen; that is the short anesthesia. It has been this shortness up to quite recently that prevented general adoption of nitrous oxide in enucleating the tonsils; but now thanks to the perfection and publication by Dr. Greenfield Sluder, of St. Louis, of his method of tonsillectomy by means of his guillotine, time does not enter into consideration any more.

I have found that the anesthesia produced by the nitrous oxide is of sufficient duration, not only to perform a complete tonsillectomy, but to remove the adenoids as well under a single administration. Ordinarily it takes on an average of thirty seconds to anesthetize a child and forty-five seconds for an adult. It should be remembered that the patient is not carried into the stage of cyanosis.

It is possible by means of the Sluder method to enucleate both tonsils and remove the adenoids in less than thirty seconds.

It has been advanced that one of the objections to the infliction of three rapidly successive wounds is that over-stimulation of the peripheral ends of the vagi may reflexly cause sudden stoppage of the heart, or produce a dangerous amount of shock. The question which then suggests itself is, Should there be a limit to our speed, and would it be better to divide the operation and give two administrations of nitrous oxide?

I myself think there is very little shock produced by tonsil and adenoid operations, nor do I think that the reflex stoppage of the heart need be seriously considered; for never have I heard of a case or seen one reported where such a result prevailed, no matter how long or severe the operation.

I have questioned my patients as to the pain during and after operation, and from their actions and answers conclude that there is a marked period

of analgesia following nitrous oxide; just how long this analgesia lasts I am as yet not prepared to say.

As to the bleeding following tonsillectomy under nitrous oxide I will say that there often seems to be a slight increase in the time required for coagulation. The changes are, however, not constant, and I think they are easily overcome by the administration of calcium lactate over a period of a week prior to the operation.

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MEDICAL AND SURGICAL PROGRESS.

HUMAN AND RAT LEPROSY.

A REVIEW OF RECENT LITERATURE.

By M. F. Engman, M. D., of the Editorial Staff.

1. Van Houtum: Cultivation of Bacillus Lepræ. (*Journ. of Path. and Bact.*, September, 1902.)
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9. De Verteuil and de Verteuil: Salvarsan in Leprosy. (*Brit. Med. Journ.*, p. 655, September 23rd, 1911.)
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Through the constant, untiring efforts of science, the mediaeval sphinx, leprosy, is beginning to divulge some of its secrets. It has come down to us through the ages that leprosy is contagious, therefore isolation-houses have existed as far back as A. D. 506. At the end of the thirteenth century there were about 2,000 leprosy asylums in France alone, and at least 200 in Great Britain and Ireland, which was undoubtedly a very potent factor in retarding the spread of the disease. The knowledge of the infectiousness of leprosy was largely confirmed by the discovery of the leprosy bacillus by Hansen in 1871. Since that time, during the modern progress of bacteriological technique, numerous investigators have tried to grow the leprosy bacillus, but their efforts have been in vain, and experiments upon the lower animals seemed to have produced only discouraging results.

In 1902 G. Van Houtum claimed to have grown the leprosy bacillus in a medium consisting of one-third beef broth and two-thirds fish broth, but the writer does not believe his researches have been confirmed. It was not until 1910 that any cultural results proved successful, when Moses T. Clegg, working in the Bureau of Science at Manila, grew an acid-fast bacillus symbiotically with amœbæ from the leprous nodules and spleen of leprous patients. By complicated bacteriological technique he finally succeeded in growing this acid-fast bacillus in pure culture.

Shortly after this, Duval, of Tulane University, New Orleans, succeeded in growing an acid-fast bacillus from leprous nodules and ulcers on a medium prepared as follows: The rind was carefully removed from the fruit portion of fully matured green bananas, all precautions to avoid contamination being used, and large blocks of the fruit were introduced in a slanting manner into sterile glass cylinders, at the bottom of which were cotton plugs wet with sterile distilled water. The plugs served to furnish moisture, and prevented the medium from drying. Sterile 1 per cent. solutions of tryptophan, cystein, and leucin were next prepared and a portion of each poured on and allowed to saturate the banana. These solutions were used separately and in varying combinations to determine in which the bacilli would grow best. The cultures were incubated at 30° C., and grew rapidly. In the transplants the bacilli developed in the form of small, glistening, white colonies in from four to six weeks. Growth on the protein-cystein medium showed very conclusively that the leprosy bacillus utilizes the end-products of digestion, and not the products of cell metabolism. Multiplication *in vitro* of an acid-fast organism was obtained from the transplanted leprous tissue on the above-mentioned medium from four cases of leprosy, which corresponded in every essential to the leprosy bacillus. These bacilli continued to grow in stab cultures, and it has been proved beyond a doubt, by animal experimentation and cultural features, that the organism cultivated by Duval is the leprosy bacillus of Hansen. At about the same time Dr. F. W. Twort, working in England, grew the same bacillus artificially.

The writer had the pleasure of listening to a paper by Drs. Duval and Gurd, at the New York Academy of Medicine, on December 29th, 1910, when Dr. Duval stated that he believed that he had cultivated the leprosy bacillus in pure culture after a great deal of difficulty; that it was necessary to place large quantities of the infected tissue on the culture medium to insure growth; that from pure cultures of this acid-fast bacillus he had caused experimental lesions in mice and monkeys. He further explained that the leprosy-bacillus cultures remained alive and virulent for months under unfavorable conditions, which seemed to him to explain much in the

transmission of the disease where houses in which lepers have lived have seemed to convey leprosy after a great length of time. Duval and Gurd furthermore stated that direct inoculation of the leprosy bacilli is possible, but they believe that it is not the usual method of transmission, their investigation pointing largely to the nasopharynx as the most vulnerable and frequent point of entrance.

Through the work of Maj. E. R. Rost and Capt. T. S. B. Williams, of England, there seems to be a difference in the morphology of the leprosy bacillus. Their researches seem to disclose four different types of organism, which they believe are four phases of a pleomorphic streptothrix. Capt. Williams believes that the bacillary form is really the result of very rapid division of the streptothrix under favorable cultural conditions, and that these forms are convertible by suitable methods of subculture into the acid-fast organism in which a streptothrix form and a bacillary form can be observed. It seems that the acid-fast streptothrix form can be converted into the acid-fast bacillus by change of cultural environment. Capt. Williams, therefore, claims that theh four phases—namely, the acid-fast and non acid-fast bacillary type, and the acid-fast and non acid-fast streptothrix type, may be regarded as four different phases of the same organism. The animal experiments of these gentlemen afford belief that the injection of the acid-fast bacillus can cause leprous-like nodules in guinea-pigs.

The results of these various investigators are rapidly disclosing the habits and characteristics of the leprosy bacillus, and no doubt animal experimentation will soon disclose much valuable information. Duval's experiments with monkeys have been productive in showing a certain type of leprosy in those animals. The waltzing mouse of Japan seems also susceptible to this acid-fast bacillus. This brings up the very interesting subject of rat leprosy.

Stefansky made the first recorded observation on this affection in 1903. Rats are afflicted with a communicable disease which closely resembles the lesions of human leprosy. These lesions present, upon microscopical examination, a bacillus very similar in all its tinctorial qualities to the bacillus of Hansen. Furthermore, the histological architecture of the nodules from these animals is very similar to those procured from human leprosy.

Quickly following Stefansky, many other observers reported rat leprosy —namely, Rabinovitch, Dean, Bull, Query, Currie, Brinckerhoff, and others. The disease seems to occur in rats almost all over the world—in the Orient, in Europe, and in this country. However, during the examination of 16,000 rats in Honolulu, which is an endemic focus of human leprosy, during an anti-plague campaign, no case of rat leprosy was encountered. In various communities leprous rats have been found in from 0.1 to 0.2 per cent., which is the highest. The rats when suffering from the disease present cutaneous and subcutaneous nodules containing large numbers of this acid-fast bacillus. The disease is easily conveyed from one rat to another in the laboratory.

Brinckerhoff in his study of the disease, summarizes his remarks as follows: "In the leprous-like disease of rats we have an affection which closely resembles, both in its etiological activity and in its pathology, the disease leprosy in man. The fact that the disease is readily propagated in the laboratory animal permits of its investigation in any laboratory."

Currie, working along the same lines in Honolulu, finds that the digestive tracts of certain mites normally inhabiting the skin and hair of rats contain the bacillus of rat leprosy in considerable numbers, and

therefore that these parasites may be one of the means of transmitting the disease.

One can readily recognize the vast importance of a thorough study of rat leprosy. If rats suffer from a form of leprosy, or if rats maintain in their bodies the leprosy bacilli, and if leprosy is due to a bacillus, the importance of rat leprosy in communicating the disease to man is obvious.

This work is all too new for investigators to have reached any conclusion, but the facility with which rat leprosy can be studied will no doubt largely assist in clearing up the connection at present existing between these acid-fast bacilli.

The present era of science seems to be vastly practical, as it is largely focused upon the study of insect-bearing diseases. It has long been thought, especially by the Japanese, that leprosy was an insect-borne disease, and that the leprosy bacillus, before it could be communicated, must undergo some change in an animal host of the lower order. Especially has this idea been brought forward by Hutchinson in his fish theory, and by Ashmead who has asserted that leprosy may be conveyed by flies or vermin.

Brinckerhoff has done some very interesting work in this line. He allowed mosquitoes to bite lepers, and concludes that the mechanism for the transference of leprosy by the mosquito from a leper to a healthy person's skin does exist, as the fecal matter of the mosquito may contain leprosy bacilli, and as it bites the individual the animal defecates upon the skin.

Currie, working with flies and mosquitoes among lepers (and his experiments are exceedingly interesting and carefully performed), concludes as follows: (1) That flies when given an opportunity to feed upon leprous fluids will contain the bacilli in their intestinal tracts and feces for several days after such feeding; (2) that the above fact, together with the well-known habits of these flies, makes it certain that given an exposed leprous ulcer, these insects will frequently convey immense numbers of leprosy bacilli, directly or indirectly, to the skins, nasal mucosa, and digestive tracts of healthy persons; and (3) that our present state of knowledge does not permit us to determine whether such insect-borne bacilli are or are not capable of infecting persons whose skin and mucosa are thus contaminated, and that until we have more accurate knowledge on this point, we are justified in regarding these insects with grave suspecion as being one of the means of disseminating leprous infection.

Currie finds, however, that mosquitoes which are fed on ulcers of leprous patients do not contain the leprosy bacilli, the reason being that when these insects feed, they insert their probosces directly into the blood-vessel, and thus obtain the bacilli-free blood unmixed with lymph, and that this habit alone accounts for the absence of bacilli in their digestive tracts.

Sandes, working with insects in relation to leprosy, says that flies, fleas, mosquitoes and other insects are possible modes for the spread of the disease, but that such infection, if it ever does take place, is exceedingly exceptional. He believes that the bed-bug constitutes a very important agent in the spread of leprosy in leprous communities, as he finds acid-fast bacilli in the intestinal secretions sixteen days after feeding on leprous material. Long, in a brief report on the citation of a suggestive case, seems to be of the same mind.

We might say here in passing, that Hollman believes that heredity is not an important factor in the extension of leprosy, but that it is purely a question of environment and contamination or infection, and that the

danger of contracting leprosy to children born of leprous parents increases with the length of exposure.

There seems to be very little progress made in the treatment of leprosy up to now, but the fact that the organism has been grown and that experiments in lower animals are possible must soon produce some newer and more beneficial method of treatment. The *x*-ray, arsenic, and chaulmugra oil are still being used. Of course, since the cultivation of the organism upon artificial media, vaccines will occupy a prominent place in the therapeutics of the disease. Rost and Williams, working in India, have reported rather extensively upon this method of treatment, and, according to Rost, with rather surprising results. He treated twelve patients, five of whom are practically cured as far as clinical observation goes. Vaccines were given daily, which was followed by a rise of temperature to 100 to 105°F. He used one c.c. of a 1/400 dilution of dried culture and one c.c. of a sterilized six weeks' broth culture. After injections he found the local reaction in the nodules very marked, and he believes the best procedure in the nodular cases is to obtain only slight reaction, while a more marked reaction is advisable in the anesthetic type. However, the treatment is too new for dogmatic statements.

Wise has recently reported on the treatment of leprosy by nastin. He has used the remedy from December 1908 to 1910, with rather encouraging results. Deycke believes that nastin is capable of producing reactions of a general local kind in leprous tissue.

Antileprol, a dirivative of chaulmugra oil, is another remedy brought forward by Engel. He speaks very flatteringly of it. It can be given in very large doses for a great length of time without disturbing the stomach, which makes it superior to chaulmugra oil itself.

Salvarsan has been tried in leprosy by Verteuil and others without very much change in the outward manifestations of the disease.

TREATMENT OF BLADDER TUMORS.

A REVIEW OF RECENT LITERATURE.

By John R. Caulk, M. D., of the Editorial Staff.

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3. Binney: Present Status of Intravesical Operations for Tumors of the Bladder. (*American Journal of Urology,* August, 1911.)
4. Doré and Mock: Contribution to the Study of Endovesical Operations in Tumors of the Bladder. (*Annales des Maladies des Organes Genito-urinaires,* June and July, 1911.)
5. Keyes: Cauterization of Bladder Lesions. (*Interstate Medical Journal,* October, 1911.)
6. Marion: Endovesical Extirpation of Tumors of the Bladder by the Natural Channels. (*Presse Médicale,* December, 1910.)
7. Scudder: The Transperitoneal and Suprapubic Approach of Tumors of the Bladder. (*American Journal of Urology,* August, 1911.)

Great difference of opinion exists concerning the treatment of bladder tumors. During the past few months, many articles have appeared both in American and foreign literature on this extremely important subject. The problem of dealing with bladder tumors is a very serious one and the choice of procedure should depend upon the character and the location of the tumor.

The most frequent tumor of the bladder is the papilloma, and even the most benign appearing of these are extremely treacherous. We have all seen these small seemingly benign tumors, completely removed, followed rapidly by recurrences and transplantations. This fact has led most surgeons to consider the most benign bladder papilloma as potentially malignant. It is impossible to tell pathologically, whether or not a given papilloma is malignant or benign, wtihout a careful microscopic study of the whole tumor and a portion of the vesical wall; even then, one is liable to be mistaken, as cases are reported in which detailed microscopic studies have been made and the tumor pronounced benign. Later, metastases to bones, etc., have proved to be carcinoma, so the question of malignancy must always be paramount; as Scudder says, "practically all bladder tumors cause death of the patient sooner or later." If the operative deaths and recurrences of bladder papilloma are combined under the head of operative failures (Watson), these have occurred in 29 per cent. of the so-called benign, and 46 per cent. of cases of cancer.

In view of the fact that so many of these cases recurred following suprapubic excision, attention was directed to the endovesical removal, with

the hopes of avoiding these disasters; and during the past few years, this method has acquired a host of supporters. On the other hand, there are many surgeons who believe the endovesical procedure unsurgical, consider the suprapubic incomplete, and advocate the transperitoneal operation. Finally, others adhere to Watson's method of cystectomy with ureteral transplantation or bilateral nephrostomy.

Thus, the various operative procedures are as follows: (1) Suprapubic cystotomy with removal of the tumor and part of the vesical mucous membrane, either with knife or cautery; (2) suprapubic cystotomy with partial resection of bladder wall; (3) suprapubic drainage for inoperable tumors; (4) transperitoneal removal; (5) endovesical; (6) complete cystectomy.

Owing to the frequent recurrences and numerous transplantations not only in the bladder but occasionally in the line of suprapubic incision, suprapubic cystotomy is being more and more discarded. The statistics of Albarran of forty-eight benign tumors operated on by this method, show 12 per cent. recurrences, and 6 2/10 per cent. mortality. Clado's statistics, 15½ per cent. recurrences and 6 4/10 per cent. mortality. Motz, giving the results of the operations of Guyon and Albarran from 1882 to 1899, shows seventeen operations, eight cures, five recurrences, and four deaths. The statistics of Watson and Cunningham of two hundred and seven papillomas operated on by this method without bladder resection show mortality of 10 per cent.; and 20 per cent. recurrences in three years in one hundred and forty-one patients reviewed; 9 per cent. recurrences more than three years after.

The removal of a bladder tumor through the suprapubic incision is at times quite easy. But if the tumor is far down toward the base of the bladder, as is the usual location, the exposure is often insufficient. Suprapubic excision of the tumor with partial resection of the bladder-wall, after having stripped back the peritoneum, is in many cases not a difficult procedure. Of course, the farther down toward the base of the bladder the tumor is located, the more difficult the stripping back of the peritoneum, and the more difficult the operation. Recently the transperitoneal operation has been brought forward by Mayo. This method was first suggested by Rydygier, in 1888. Harrington also advocated this method in 1893; but Mayo has in recent years put it on a more substantial foundation, and it is now gradually gaining many advocates. By it, one is enabled to inspect various abdominal viscera and glands for metastasis, and is then in a position to determine whether or not a radical operation is advisable. This operation, being of recent date, it has not an established percentage of cures, recurrences, and mortalities; but the results have been satisfactory and the operation has been done with ease and safety.

Tuffier, Deguervain, Barney and others demonstrated that normal sterile urine is not very irritating to the peritoneum and that with careful manipulation during the operation, the chance of infection is small. Tennant, of Colorado, has demonstrated recently that a transperitoneal cystotomy can be done with safety even in the presence of a severe cystitis. Scudder thinks that no matter how benign bladder tumors appear, a radical excision of the whole thickness of the bladder-wall is indicated in the most benign-appearing cases of bladder papilloma. This operation is an excellent one and will, no doubt, be more frequently used.

The complete cystectomy of Watson with bilateral nephrostomy is an operation which is not done frequently; it should be done only when a

partial resection is inapplicable. Scudder remarks that the transperitoneal operation will care for many of the cases previously operated on by this method.

The method of treating bladder tumors, which is most frequently employed to-day in the hands of expert cystoscopists, is the endovesical. Of the endovesical procedures, there are several and they will be described below in more or less detail. Civiale first attacked a papilloma of the bladder through the urethra with a trilabe. In 1881, Carter, through a dilated urethra, seized a papilloma. Spencer Wells, in 1883, published three observations in women of removal of a papilloma after dilating the urethra. In 1885, Gruenfeld removed a bladder tumor through a non-dilated urethra. With Nitze, the endovesical operation found its true beginning. He described his first instrument in 1891, and, largely through his genius, the method has been perfected. Doré and Mock, in their article, take up the whole subject of the development of operative cystoscopy, giving a description of the various cystoscopes with the advantages of each. Their description is very thorough, and the readers are referred to their article if they are particularly interested in the subject. Among those, who have developed this branch of surgery, are Nitze, Coleman, Albarran, Bœhme, Lohnstein, Klose, Casper, Young, Beer, Marion, Keyes, and others.

The operative cystoscopes may be divided into the direct and indirect; and the indirect into those with the operative piece fixed, and those with the operative piece movable. The direct method has been advocated chiefly by Luys, of Paris, and Keerschmaecker, of Antwerp. Luys' instrument resembles an endoscope. His claim is that with proper care, there is less chance of obscuring the field with blood and that a better view of the tumor is obtained and cauterization more exactly performed. This type of instrument requires many sittings to complete an operation on anything but the smallest tumors. It may be applicable to some extent in the female, but it has a very narrow range of usefulness in the male. The indirect method is the one most frequently employed by one or the other of the various instruments or procedures. The most frequently used instrument is that of Nitze, and the tumor is either removed with a snare, cautery or lithotrite attachment. In America, Myer, of San Francisco, and Kolischer and Schmidt, of Chicago, are the only surgeons who published personal experiences prior to 1908. Since then, reports have come from Young, Keyes, Buerger, Beer and others. Among the various endovesical procedures may be mentioned removal with the snare, cauterization, injection of the base of the tumor, as Casper has done, removal with a rongeur cystoscope, resorcin injections after partial removal, and treatment with high-frequency current, the latter being the most recent.

Employment of the cautery and removal of the tumor with various operative cystoscopes are more or less familiar and an old story; but the method of treatment with high-frequency current, which was proposed by Beer in 1910, seems worthy of special mention, as his reported results are so satisfactory. He has treated successfully 5 cases of primary papillary tumors of the bladder, aggregating nine distinct tumors. He has also gathered reports from other operators, with a total of thirty-eight papillary growths treated in this manner; and as he says, "it must be evident to the most skeptical, that in this new method we have raised a mighty rival to the old suprapubic and to the other transurethral, operative cystoscopic methods." Among the contributors to these 38 cases are Drs. Keyes, Buerger, Wolbarst, McCarthy, Esberg, and Ware. In the October num-

ber of the JOURNAL, Dr. Keyes has reported his results which are entirely in harmony with those of Dr. Beer. The essential instruments for this line of therapy are a high-frequency current with the Oudin resonator, a catheterizing cystoscope and a heavy insulated copper wire. This method of treating papillary growths with the Oudin current has been in use for fifteen years for the removal of surface growths, but its application to tumors of the bladder was made by Dr. Beer in 1910.

The application consists in the passage of the current through the insulated copper electrode among the villæ of the tumor, and it is allowed to play from fifteen to thirty seconds at each application. The nearer the electrode approaches the base of the tumor, the shorter the application, and repeated applications are made at different spots of the growth until the whole growth is destroyed, disintegrated, and voided in small pieces. The longest total applications that Beer has used at one sitting, aggregated ten minutes and thirty seconds at twenty different spots. He says a total of three to five minutes will usually suffice. This procedure is repeated at intervals until the growth is destroyed. His results by this method have been very striking and as he says, "must convince the skeptical:" In general, it may be stated that the endovesical method should be used for small tumors, particularly papilloma, and for recurrent tumors, although the method is applicable in several sittings to tumors of large size. Marion says, "among the pediculated or sessile tumors, all those whose appearances are simultaneously seen in the field of the cystoscope placed in the central position in the bladder, and whose volume does not exceed that of a small walnut, should be removed by the natural route." The number of tumors is no contraindication to the method. In fact, it speaks for it. As Pasteau says, "the endovesical operation is particularly to be preferred in small and numerous tumors, because with the open bladder, they may be missed, being obscured beneath the folds of the mucous membrane." As said before, the method is particularly valuable in recurrences after a suprapubic or otherwise. Tumors can be followed cystoscopically and cauterized with the high-frequency current, as they appear. The method is also employed in some cases to control bleeding, and palliatively to prolong life. Nitze has employed it in infiltrative tumors, both as palliative and radical. The advantages of the method are that the patient does not have to take an anesthetic, that the danger of implantation is less, that one is not as liable to overlook small tumors as with an open bladder, that the patient can be up and attend to his business, and does not run the danger of a fistula.

This method is not as a rule applicable in infiltrative tumors. Some advise against it in very large tumors or very vascular tumors, owing to the danger of hemorrhage. Hemorrhage, however, is not as a rule troublesome, particularly after high-frequency treatment or cauterization. It is seldom alarming, and as a rule can be controlled by lavage. It is unusual to have to employ suprapubic cystotomy on account of it. Weinrich says, that the size of the tumor does not contraindicate the use of this method if the bladder is not contracted, so as to interfere with manipulation.

Intense cystitis, contracted bladder, and tendency to hemorrhage by distension of the bladder, contraindicate the method. Among the opponents of these procedures have been Israel, Rovsing and von Frisch. The last two give as their reason the high percentage of malignancy and consider the operation unsafe on that account. Cathelin and Rafin have been opposed to it on account of technical difficulties; but after weighing

evidences for and against, it seems that this method is the one of choice in many cases of bladder tumors.

The mortality statistics following endovesical operation are as follows: Statistics of Nitze in 1905, presented by Weinrich, comprise 150 cases, with one death, as compared with 14 per cent. following the suprapubic method. Fifty per cent. of these cases showed no recurrence in three years. In Nitze's own cases twenty recurred or 11 per cent. of the whole number. Statistics of Strauss, twenty-two operations, four recurrences, 18 per cent. Those of Marion, 12 cases, eight of which have been followed, six cures, 75 per cent., one recurrence two years after. These cases comprise five papillomas, two epitheliomas, one infiltrative tumor, and three pediculated tumors.

Thus it seems that of the various operations dealing with bladder tumors, the two most important are the endovesical, particularly with high-frequency current, for benign tumors, and the transperitoneal for ones which cystoscopically and clinically seem to be malignant.

SOME RECENT LITERATURE ON SPINAL CORD TUMORS.

A REVIEW OF RECENT LITERATURE.

By Sidney I. Schwab, M. D., of the Editorial Staff.

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7. Frankel: Growths of the Vertebral Column as Shown in X-ray Pictures. (*Fortschr. a. d. Gebiete d. Rœntgenstrahlen,* No. 16, p. 345, 1911.)
8. Potts: Intradural Cyst of the Spinal Meninges Removed by Operation; Recovery of the Patient. (*Journ. of Nerv. and Mental Dis.,* No. 10, 1910.)
9. Engels: Casuistic Contributions on the Segmental Diagnosis of the Cord. (*Deutsche. med. Wochenschr.,* No. 2, 1910.)
10. Hunt and Woolsey: Tumors of the Cord. (*Annals of Surgery,* September, 1910.)
11. Bailey: Anesthesia and the Lack of It in the Diagnosis of Spinal Cord Tumors. (*Journ. of Nerv. and Mental Dis.,* No. 4, 1910.)
12. Oppenheim: Contributions to the Pathology of the Cord. (*Zeitschr. fuer die gesammte Neurologie und Psychiatrie,* No. 2, July, 1911.)

There are a number of interesting questions presented by spinal cord tumors which are still in the process of solution. It may be of interest to review some of the literature, in order to see if we are any nearer a fairly complete understanding of the various problems presented by tumors of the cord. About twenty-five years ago Gowers made the diagnosis and advised operation in the first recorded case of spinal cord tumor, which was carried out by Victor Horsely in 1887. The original Gowers and Horsely case stands out to-day as one of the most important contributions to neurology and surgery. Ten years later Brun's monograph appeared, and in this 20 cases operated upon were described. The number of cases noted by neurologists and surgeons now rapidly in-

creased, and in 1908 there were at least 140 cases easily accessible to the medical reader. Since that time—that is, within two or three years—the number of cases has increased very much. The operative mortality is now about fifty per cent., and this mortality corresponds roughly to the percentage of improvement in cases of this kind. Still, in the presence of a suspected case of spinal cord tumor, the differential diagnosis and surgical treatment apparently offer almost as great a variety of problematical instances as they did in the early stages. It is for the purpose of determining whether these problems have become any simpler—or, rather, whether we are in possession of data making their solution less difficult than before, that the present review of recent literature is reported here.

A very comprehensive paper by Flateau (1) might well form the starting point of this inquiry. This paper was published in 1910 and is based upon material of 21 cases, personally observed and studied by the author. He divided this material into three divisions: The extra-, the intra-vertebral, and the vertebral. This division would be similar to the more commonly used American, or English classification; that is, the spinal, the extra- and the intra-spinal. The clinical description of this series of cases is well worthy of attention. In detail and general rounding-up of the clinical data the French are masterly. In a brief review, space is lacking for more than a glance at the conclusions of this brilliant paper. The one-stage operation is advised. The mortality percentage is about 50 per cent., and corresponds more or less with the percentage of cured and improved cases. This is about the same as is found in the Oppenheim series. Particular attention is called to the necessity of avoiding undue traumatism in operation. As to the number of vertebræ which can be removed, it is wrong to suppose that the column would lose to any great degree its static ability. Although it is possible to localize with great exactness the primary seat of the tumor, it is likewise necessary to remember that up and down the cord, starting from the level at which the tumor is located, there is usually found an edema which is capable of causing most important symptoms. This edema may become localized by inflammatory process of meninges, and even if the tumor is removed, the persistence of the former condition may be responsible for the permanency of cord injury and lack of surgical success. In regard to the incising of the dura mater. Flateau says it is of great importance to place the patient in the Trendelenburg position, with the head as low as possible. On the question of the restitution of function, following the successful removal of the tumor, the author can give no very positive information. He calls attention to the fact that complete restitution is possible even when the cord is apparently completely compressed. At the same time, it is found that no restitution takes place—or practically none—when the injury to the cord is scarcely evident. In speaking of the fatal results of operation, the author gives as causes faulty technique, septicemia, and a group of causes of which we know very little. Death apparently follows operation for no other reason than that the spinal cord or the brain cannot stand the operative traumatism. Before leaving this paper, attention should be called again to the complete report on the pathological data of the cases, to the careful clinical histories, and particularly to the complete bibliography, which brings the literature practically up to the date of the publication of this paper.

In the year 1910 there appeared fifty-eight papers devoted to the question of tumors of the spinal cord. As most of these papers were concerned, not alone with the clinical problem, but likewise with operative

procedure, it can be seen how much the interest of neurologists and surgeons has been aroused since the first publication. Of particular interest in the whole problem has been the differential diagnosis between the extra- and the intra-medullary growth; the importance of this distinction is obvious. It was formerly supposed and is generally pretty well believed at the present time that if a tumor of the cord could be definitely localized within the cord, operative procedure would be contraindicated. There are two contributions, in the literature gone over pertaining to this phase of the question, which are of interest.

Auerbach (2) reports a case in a woman thirty-three years old. The disease began with pain in the right upper shoulder region and likewise in the upper arm. Later there developed paresis of the right hand and atrophy of the interossei on the right hand to the elbow; the temperature and pain sensation declined. There were spastic gait, double-sided clonus, and Babinski. The pain is distributed on the right side to the neck. A laminectomy showed no tumor, but was followed by some decline of pain. The autopsy, however, showed an intra-medullary tumor located chiefly in the cervical enlargement. There is in this group of symptoms no particular reason why the tumor should have been localized within, rather than external to the cord. An operation was plainly indicated.

In a paper by Veraguth and Brun (3) is reported what is apparently the first case on record of a tumor within the spinal cord, in which a growth has been removed successfully, with disappearance of nearly all the spinal symptoms. The case was one of solitary tubercle under the pia mater and within the cord substance, at the level of the fourth and fifth cervical segments. At the outset of the illness, there were pain, with stiffness in the neck and an area of diminished sensation for touch, and pain over the left shoulder. The knee-jerks increased, both sides ankle clonus and Babinski. The left arm and leg became paralyzed, and afterwards the right arm and leg became impaired. The left arm became totally anesthetic, and on the right side sensation for pain, cold and warmth, became diminished. The left phrenic nerve became paralyzed. In the subdural space no tumor was found. The pia mater was divided and a small tumor was found imbedded in the substance of the spinal cord. It proved to be a solitary tubercle surrounded by a thick connective-tissue capsule. An examination made one hundred and thirty days after the operation showed almost a normal condition. If these 2 cases are compared, it can readily be seen that in the latter a tumor within the substance of the cord would seem the more probable diagnosis, on account of the dissociation of the sensory from the motor symptoms. In the other case, however, no such dissociation being present, the diagnosis would seem to be in doubt.

A rather novel point on the question of level diagnosis is to be found in a paper by Babinski and Jarkowski (4). They make use of the fact that when the spinal cord is completely sectioned, an increase of reflexes appears in the part of the body below the section, the sphere of the increased reflexes corresponding to the area of anesthesia; but when, instead, a simple section of the spinal cord is injured longitudinally, then the anesthesia and increase of reflexes extend to different levels: the first corresponds to the upper limit, and the second to the lower limit of the lesion. The authors describe 3 cases in which this principle was used, and they are inclined to think that these reflex movements might, perhaps, be produced in cases of transverse spasmodic paralyses without anesthesia.

Inasmuch as an examination of the spinal fluid is a common procedure in suspected cord tumor, the observations of Kleineberger (5) are of interest. In the 4 cases forming the material of his paper, the fluid obtained by lumbar puncture was of clear amber color containing a large amount of fibrillation and 3 per cent. albumin, and in addition showing lymphocytosis. In all these 4 cases operation showed an extra-medullary tumor. It is probable that the yellow coloration of the fluid was due to some blood derivation.

In this connection Nonne (6) makes note that in 6 cases of tumor of the spinal cord he found the phase-one reaction, the so-called Nonne-Apelt, without lymphocytosis. Of these 6 cases, 2 cases were operated on, 2 came to autopsy, and one case was diagnosed independently by himself and Oppenheim. In one of the cases an intra-medullary tumor was found. From the above experiences, he concludes that the combination of a strong phase-one reaction and an absent lymphocytosis cannot be used to differentiate between an extra- and an intra-medullary tumor.

The aid which an *x*-ray examination gives in cases of tumor of the cord has been much discussed. It seems to be the concensus of opinion, however, that it is almost impossible to obtain a satisfactory result, except when the spinal column itself is involved in the growth. Frankel (7) calls attention to the fact of the frequency with which the metastatic and the malignant growths elsewhere in the body are found in the vertebræ, particularly when the primary growth is located in the prostate, or breast. Such metastases, particularly in cases of prostatic carcinoma, are the first evidences of disease, and are frequently the cause of errors in diagnosis; therefore, in cases of elderly men with pain in the bones, or in the region of the sciatic nerve, and other neuralgias, an examination of the spinal column with an *x*-ray picture is very essential. The metastases are most frequent in the lower dorsal and the upper lumbar vertebræ. Primary tumors of the vertebræ are rarely met with. When they are found, they are, as a rule, malignant and of unfavorable prognosis, and the primary tumors of the vertebræ can be, as a rule, distinguished from the metastatic growths. In the metastatic, as a rule, the shadow does not extend from the vertebræ to the neighboring soft parts; in the primary malignant growths the shadow is limited to the original seat of location. In addition, the carcinoma and enchondroma can be distinguished by the *x*-ray. Included in this paper are twenty pictures showing the results of the author's studies.

In a paper by Potts (8) an interesting point in spinal localization is brought out. The case had reference to an intradural cyst of the spinal meninges, which was removed by operation. The most interesting fact of the case was an isolated testicular analgesia, which disappeared following the removal of the tumor. The author believes that probably the spinal centre for the sensation of the scrotum is the eleventh and twelfth dorsal and the first lumbar segments, and that the dorsal segment receives its impression from its connection with the sympathetic system.

In a paper by Engels (9) there is some discussion in his second case of stab-wound at the height of the second and third lumbar segments, which may have reference to more exact localization of tumor growths in this region. His observation seems to prove the fact that the centre for the peroneal group of muscles is located higher than the segments involved in the lesion.

Hunt and Woolsey (10) regard stiffness of the spinal column, with localized pain and tenderness, as characteristics of tumors of the column. They take up again the question of differential diagnosis between the

intra- and extra-medullary tumors. Extra-medullary tumors develop from the beginning, with progressive paraplegia, with pain of segmentally distributed character. In intra-medullary muscle, pain is a warning of its appearance and suggests more of a subacute or chronic myelitis. In this paper is found the description of 13 cases of spinal-cord tumors operated upon and reports concerning the progress of the cases after operation.

Bailey (11) calls attention to the importance of anesthesia, or some sensory disturbance, as a necessary part of the diagnostic features of the spinal-cord tumors. In tumors of the spinal cord, as a rule, there is no very definite upper limit of sensory disturbance, such as is found in myelitis and traumatic lesions. He believes that the dissociation of sensation is no differential diagnostic point of value in intra- and extra-medullary cases. For the localization of the tumor disturbances of tactile sensation is the most important, if the sensory difference can be of value. In cases of completely intact sensation, tumors of the spinal cord cannot be diagnosed with certainty and should not be operated upon. In spite of this very definite statement, however, the author quotes one case of caudal tumor in which there was no disturbance of sensation.

It can be seen from this array of papers that the difficulties presented by spinal-cord tumors are, or can be, placed under three different heads: (1) The diagnosis of the tumors themselves; (2) the localization of the tumor after is is diagnosed, and (3) whether it is an intra- or an extra-medullary growth. On the second point it can be seen what progress has been made within the last two years. The localization can now be made with a great deal of exactness; so much so, that practically in no case is it necessary to remove more than three vertebræ. In regard to the last question there seems at present no definite unanimity of opinion, and one is forced to admit that in the presence of a tumor, plainly diagnosed and carefully localized, the question of intra- or extra-medullary position must be left for the operation itself to disclose. The question of diagnosis is mainly dependent upon tumors located within the limits of the actual cord substance; that is, between the high cervical and low lumbar limits. The territory embraced in the cauda-equina, the conus and the epiconus is still a region full of diagnostic pitfalls. Not only is the localization in this region extremely difficult, but exploratory operations directed towards discovering the lesions here are accompanied by a degree of mortality; and for the present, at any rate, we must regard this region as one difficult of surgical approach with safety to the patient and difficult of diagnostic accuracy, both as an actual fact and of localization. In this connection a very instructive paper by Oppenheim (12) is very much to the point. In this paper 3 cases are quoted in great detail, in one of which, in spite of the most careful study and apparently accurate data for localization in the operations performed by Kruse, no tumor was found. Two operations were done, in each of which three vertebræ were removed, with no relief of symptoms. In the second case practically the same condition was found. There was a negative finding in the second case by the operation and by the autopsy. It was only when the cord was examined microscopically that the evidence of tumor formation was found. This paper of Oppenheim's is a very suggestive contribution, and suggests that in tumor-symptom-complexus in the cord there may be other processes unrelated entirely to tumor formation, which, on account of their localization, produce practically the same clinical feature. Another thing that this paper brings out is, that in an instance of fatal ending of spinal-cord operative case it is always necessary to examine the spinal cord microscopically before coming to the conclusion that the diagnosis was wrongly made.

X-RAY THERAPY IN GYNECOLOGY.

A REVIEW OF RECENT LITERATURE.

By E. H. Skinner, M. D., of the Editorial Staff.

1. Albers-Schœnberg: Roentgen Therapy in Gynecology. (*Verhandlungen der Deutschen Roentgen-Gesellschaft,* Band V, p. 21; *ibid,* Band VI, p. 26; *Archives Roentgen Ray,* Vol. XIII, p. 196; *ibid,* Vol. XIII, p. 260.)
2. Bardachzi: Upon Roentgen Therapy in Gynecology. (*Muench. Med. Wochenschr.,* No. 42, p. 2184, 1910.)
3. Bordier: X-ray Treatment of Interstitial Uterine Fibroids—Artificial Premature Menopause. (*Archives Roentgen Ray,* Vol. XIV, p. 211.)
   The Radio-Therapeutic Treatment of Fibroma of the Uterus: Its Efficiency, Indications and Results. (*Archives Roentgen Ray,* Vol. XVI, p. 92.)
4. Courmelles: Sterilization by Means of the X-rays. (*Archives Roentgen Ray,* Vol. XIII, p. 196.)
5. Dœderlein: The Roentgen Rays in Gynecology. (*Monatschr. fuer Geburtsh. und Gynækol.,* Band XXXIII, Heft 4 and 5.)
6. Frænkel: Favorable Influence upon Periodical Pains and Diseases of Women by the Roentgen Rays. (*Fortschr. an der Gebiete der Roentgenstrahlen,* Vol. XIV, p. 120.)
7. Griscom and Pfahler: Roentgen Therapy in Gynecology. (*New York Med. Journ.,* Vol. 91, p. 135.)
8. Gœrl: Sterilization of the Female by the X-rays. (*Muench. med. Wochenschr.,* No. 34, p. 1788, 1910.)
9. Krœnig and Gauss: How Much will X-ray Treatment Influence Our Operative Treatment of Menorrhagia and Myomas. (*Muench. med. Wochenschr.,* No. 29, p. 1529, 1910.)

X-ray therapy is assuming a position of the greatest importance in gynecology, because the *x*-ray, when carefully applied, can do the patient no harm, whereas it may probably spare the patient a most severe operation. All the literature upon this subject is recent, and it has been difficult to choose a limited number of articles for review, as especially the German literature has been abundant both in the theory and practice of gynesic *x*-ray therapy.

Courmelles, Frænkel, Gauss, Goerl and Deutsch were among the first to call attention to the practical usefulness of the *x*-ray in promoting an artificial menopause and the application of this procedure in the treatment of uterine hemorrhage incident to the presence of fibroids and myomas of the uterine body. Albers-Schœnberg, as is his custom, applied himself to perfecting the technique of such irradiations and has endeavored to place the gynesic rôle of the *x*-ray upon a firm basis of fact.

Bordier has more recently outlined a technique which may be duplicated by an experienced radiologist with the employment of a radiometer of the Bordier or Holzknecht type.

Laboratory evidence in abundance has been published upon the atrophic action of the *x*-rays upon the ovary and testicle. In the human subject it has been shown that *x*-ray irradiation can produce infecundity without impotence. The rationale of gynesic irradiation depends upon this action, *i. e.*, ovarian atrophy and the artificial menopause incident thereto. The favorable change in the size and symptoms of uterine benign tumors at the critical period has frequently postponed operative procedures. Up to the advent of the *x*-ray there has been no means of advancing or producing the menopause except by surgical removal of genital organs.

In addition to the experimental knowledge of the vasoconstrictive action of the *x*-ray upon the ovaries, there are now abundant clinical reports of the uniformly favorable results obtained in the therapeutic application of the *x*-ray. Albers-Schœnberg states that we may expect certain definite changes as follows: (1) The cessation of menstruation, producing a reduction in the myoma mass and the disappearance of the menstrual or intermenstrual bleeding accompanying myomas, together with relief from pain; (2) the relief of post-climacteric bleeding; (3) the lessening or cure of conditions in the post-climacteric period depending upon myomas without bleeding; (4) the alleviation of menstrual pain in the young without sterilization if possible.

The results of gynesic irradiation have been well outlined by Pfahler and correspond with the results as generally published. The artificial menopause is produced the more easily the nearer the patient is to the natural menopause. It is quite difficult to produce an artificial menopause in the young woman without long continued irradiation, and even then this cessation of menstruation may be only a temporary affair. In older women it is necessary to continue the irradiation long after the cessation of the hemorrhage to insure results. The reduction in the size of the tumor is always a delayed event and in some cases never occurs. Intramural growths seem to recede more rapidly than the subserous or pedunculated, and those tumors of long duration, which have undergone degeneration or calcification, are frequently unchanged.

The control of the hemorrhage attending myomas through irradiation is peculiar. Pfahler reports that it is frequently the first symptom to disappear, but this is at variance with the Continental radiologists. Albers-Schœnberg, Goerl, and others report that the period following the first series of exposures is usually quite profuse; in fact, more than has been the wont, but that following this first profuse menstruation there is a gradual recession leading to a total absence of the menses. This first profuse menstruation following the inception of *x*-ray treatment has lead several Continental radiologists to warn against the employment of radical and large *x*-ray dosage in the treatment of those women suffering with a profound anemia.

The relief of pain and bleeding in the post-climacteric period yields to *x*-ray therapy, if there is not an element of malignancy in the case. This fact should force the radiologist to be most sure of the diagnosis of the cases which he accepts for treatment, as results will depend upon the benign nature of the growths. Bordier has pointed out that degenerative fibromyomata, fibromata with hydrorrhea, and cystic fibromata, do not justify radio-therapeutic treatment. Albers-Schœnberg says that patients with less than 40 per cent. hemoglobin and great losses of blood with myomas must be excluded from *x*-ray therapy.

Dœderlein, while expressing the opinion that, while gynesic *x*-ray therapy is still somewhat experimental, fine results may be expected, especially in climacteric hemorrhage where neither palpation nor microscopic examination can discover whether the hemorrhage is due to the degeneration of vessels in the uterus, disease of the ovaries, myometrium or endometrium. He feels that all other methods of treatment generally fail unless the apparently sound internal genitals are removed when the hemorrhages are weakening to such an extent that it is impossible to await the natural retrogression of the genitals with the approaching menopause.

Frænkel had his attention drawn to the use of the *x*-ray in gynecology in the course of the treatment of other conditions with the *x*-ray. He has given us much information regarding the production of a temporary menopause in younger women, especially where they were suffering with a dysmenorrhea. Without undue exposure he has obtained some surprising results without producing a permanent sterility or any interference with future fecundations. Reifferscheid also reported similar gratifying results in this class, but considered that there is danger in the young of malformation of the embryo in conception later. It may be that these fears of Reifferscheid were occasioned by his intimate acquaintance with the effect of prolonged exposures upon animals.

The most important feature of this work is the employment of a definite and constant technique for the exposures. It is not sufficient to put the abdomen of the patient suffering from fibroma before a focus tube and watch the fibroma disappear, the losses of blood vanish, and the menopause become established (Bordier). Nothing is to be gained unless we dose carefully both the quantity of *x*-ray energy introduced and the quality of the rays employed. Most of the literature reviewed here is rich in a delineation of results, but fails to convey an idea of the technique employed so that another could duplicate the dosage. However, Pfahler, Albers-Schœnberg and Bordier have been rather explicit and their respective methods will be fully described. This lack of description of an author's technique is not unusual, and it is pleasing to note that it is usually those of undoubted radiological ability who employ and describe an exact method in *x*-ray therapy.

It is generally conceded by all that the exposures should be given with the patient in the horizontal position and that the rays should be directed through the abdominal wall and not through the vagina. The compression diaphragm should be used and the rays focused upon both ovarian regions and upon the uterus. Pfahler makes a good suggestion on the focus point when he advises that the record of the area treated be obtained by placing a photographic plate beneath the patient. When developed this radiograph should show the lower part of the brim of the pelvis and the lower segment of the sacrum, similar to the shadows obtained in a bladder examination. It is also necessary to use filters to prevent dermititis and filter out the soft rays as we only desire the hard penetrating ray to obtain results.

Bordier lays great stress upon the use of his chromo-radiometer tubes giving off penetrating rays registering Nos. 11 and 12 Benoist, and adequate filtration. He gives his exposures in series, each series consisting of nine irradiations, introduced by three routes—through the two lateral regions and the median line. Each of these surfaces receives three irradiations at intervals of two days each. The dose of the rays given at each séance is the maximum compatible with the integrity of the skin,

about 5 I (Bordier units) measured under the filter. By thus fractioning the dose he permits the introduction of a much larger dose, without the risk of dermatitis, than can be absorbed at a single séance. Bordier uses aluminum sheets for filtration. The first day he treats the two sides in succession, using a filter 1 millimetre in thickness. One of the Bordier pastilles is attached to the skin to be irradiated and the focus tube adjusted with its principal axis directed to the ovarian region, so that the divergent rays shall fall on the fibroma. The second day the patient rests. The third day, median radiation with a filter 2.5 millimetres thick, and with a dose of 1.5 I to 2 I, measured by the pastille. The fourth day the patient rests. The fifth day, the two sides are irradiated through a filter 1.5 millimetres thick. The sixth day, rest. The seventh day, median irradiation with a filter 3 millimetres thick. The eighth day, rest. The ninth day, irradiation of the two sides with a filter 2 millimetres thick. The tenth day, rest. The eleventh day, a final irradiation of the median area with a filter 3.8 millimetres thick. After this series of irradiations the patient rests for three weeks, and the time should be arranged so that the menstrual period occurs during this rest. A second series similar to the first is then given and the patient rests for three weeks when a third series is given. While Bordier finds that this is sometimes sufficient, he generally gives a fourth and fifth series. These intervals in the treatment permit of a much larger dosage, and the rest provides for a recession of a possible erythema.

Pfahler recommends that the target of the tube be placed 12 inches from the skin; that the tube register 6 or 7 Benoist; that the patient receive from 15 to 20 milliampére minutes or its equivalent: that the patient receive a series of five or six treatments and then interrupt for two weeks. He uses slight compression with the cylinder and the protection of the skin with sole leather filtres. In order to obtain a constant exposure with uniform hardness of the tube, he frequently requires three or four tubes for each séance, using each one for about two minutes. Pfahler says that in no series of exposures should more than 10 Kienbock units be given (an erythema dose).

Albers-Schœnberg method of focusing is the same as Pfahler's. He filters, however, through six layers of tin-foil interposed between four layers of kid leather, one millimetre thick. He recommends the use of a water-cooled tube which is arranged to provide a constant flow of cold water to the anticathode of the tube. The hardness of the tube should be 6 to 8 Walter with a current of 4 to 5 milliampère. By this method he obtains the exact dose he requires in six minutes. While advocating no especial form of measurement for dosage to the skin beneath the filtre, he insists that at no series of exposures should more than the maximum erythema dose be given. He begins with six minute irradiations upon four successive days, all the above factors remaining constant, and waits fourteen days for a series of three irradiations. Then another wait of fourteen days and a repetition of three irradiations. Such series are repeated until the treatment shows itself effective, but during the whole course of the treatment the skin is carefully watched for the first sign of erythema, and if this occurs the treatment is suspended. In the treatment of cases of menorrhagia and dysmenorrhea, uncomplicated by myomas, he recommends the irradiation of the patient immediately following the period for four sittings of five minutes each with a similar series following the succeeding period. The duration of *x*-ray treatment should depend entirely upon the end we have in view. While a few

series of exposures may be sufficient to relieve a dysmenorrhea, it would require a large number of such exposures to obtain a complete suppression of the menses. So much for the technique.

With regard to the mechanism of the action of the *x*-rays in this treatment, there is some contention as to whether the atrophy of the tumors is a result of the precocious menopause or due to the direct action of the *x*-rays upon the cells of the fibroma. Bordier is inclined to the latter view as he has frequently found the tumor reduced in size before the cessation of the periods. Again, where there had been a cessation of the periods after two Bordier series and no diminution of the size of the growth, the exposures were resumed after four months' interval and the tumor gradually vanished. Then he also on two occasions treated patients in whom the menopause had occurred, but a very troublesome fibroma produced vesical and venous symptoms; the *x*-ray produced a reduction of the tumor and disappearance of the symptoms.

Reifferscheid has been able to examine the ovaries of six irradiated women and found "a degeneration of the epithelium of the follicles, an atresia of the Graffian follicles over the whole extent of the anterior aspect of the ovary, and little capillary hemorrhages in the cortical layer." The internal secretion of the ovaries does not seem to be modified. Women submitted to the radio-therapeutic treatment have not the so-called "flushes of heat" after the artificial menopause is established.

The voluminous case-reports attached to the articles of Albers-Schœnberg, Pfahler, Goerl and Bordier lend favorable criticism as to results, but the limits of this review are such as preclude their individual mention. To those who are anxious to delve more deeply into this subject, we would however refer them to the articles of Pfahler and Bordier in the English language and to the monograph of Reifferscheid, which includes a critical review of the Continental literature.

The possibility of sterilizing the female by *x*-ray methods is a cogent reason for interdicting the use of the *x*-rays by persons who have not a medical diploma (Bordier). One can readily imagine the use to which this agent could be applied if left in unscrupulous hands.

CORRESPONDENCE

PARIS LETTER.

HYPERTROPHY OF THE THYMUS AND ITS CLINICAL FEATURES.

By Auguste A. Housquains, M. D., of Paris.

Cases are far from rare in which the autopsy does not reveal, especially in children who have died suddenly, some other lesion besides enlargement of the thymus. Hence it is logical to state that there is a relation between cause and effect. On the other hand, when children die as the result of divers affections, the autopsy reveals at times, upon opening the thorax, a hypertrophied thymus which no functional disease during life betrayed as being present.

The obscurity which surrounds the clinical diagnosis of hypertrophy of the thymus has not been lessened by the many investigations which have recently been undertaken on behalf of this disease. Nevertheless, on account of the grouping of facts in connection with this disease, and which for the last two years have been thoroughly studied by the Pediatric Society and the French Association of Pediatrics, we are to-day in a position to group the symptoms so thoroughly that we are justified in speaking of a thymic syndrome. Truth to say, this syndrome consists of functional and physical symptoms peculiar to other affections. But it is equally true that it is not impossible in decisive cases to arrive at so precise a diagnosis that there is no doubt of its certainty.

A thesis recently prepared by M. Malavialle, of Montpellier, has brought out in an excellent manner this point of the question. His investigations, inspired by M. Marcel Ferrand, which were made in Paris whilst in the service of M. Variot at the Children's Hospital, are strengthened by quotations from numerous bibliographic sources. This thesis has so many good points that I have deemed it advisable to make frequent citations from it for the benefit of the readers of the Journal.

At first it is necessary to advance the principle that there is no specific symptom in connection with hypertrophy of the thymus. Considered alone, each symptom which could be mentioned is fallacious; but at least it has to its credit that is calls the attention of the clinician to the case and goads him on to further researches, so that other signs may aid him in making a diagnosis. It is precisely on account of their grouping and their concordance that the signs of hypertrophy of the thymus acquire clinical value.

From a clinical standpoint, hypertrophy of the thymus can manifest itself by physical and by functional symptoms. The latter result principally from compression of the organs in the cervical region. As

to the physical signs, to find them is no easy matter and demands close attention. The functional signs are often in the respiratory apparatus and in the blood circulation. In the former one may observe dyspnea which may be permanent and may begin during the first weeks of life; often enough this dyspnea is accompanied by wheezing which can be detected both during inspiration and expiration, but principally during inspiration. When the dyspnea is decidedly marked, it is accompanied by elevation and depression of the substernal or even of the subclavicular regions and the intercostal spaces. It is interesting to note that in spite of the permanent compression exercised by the hypertrophied thymus, the dyspnea is not permanent; in certain cases, in fact, it is seen in the form of more or less violent crises, occurring at times with startling suddenness in a child apparently healthy. Frequently the attacks are nocturnal. The respiration stops suddenly, the child labors for breath and becomes cyanotic. The duration and the intensity of these crises are extremely variable; sometimes lasting only some seconds, and then many hours.

All those causes which may have a tendency to congest the thymus, such as infectious diesases, in particular measles and diphtheria, may aggravate the dyspnea or increase the number of the crises.

As to the circulatory complications, they result principally from the obstacles to the free venous circulation concomitant with an enlarged thymus. One notes at times cyanosis of the face, at times engorgement of the superficial veins of the neck with undue elevation of the subclavicular depressions. In extreme cases the circulatory interference may proceed up to a veritable cerebral congestion; the child then presents all the signs indicative of coma.

Besides the functional signs already mentioned, there are others which are much rarer, but which must be mentioned here lest the reader will think them of secondary importance. These are, for example, difficult deglutition, or, in other cases, the alterations in the timbre of the voice, and even the occurrence of aphonia.

The investigation of the physical signs ought to be made in a systematic fashion, if one wishes not to overlook information which may be of great importance from the point of view of a correct diagnosis. The examination of the patient shows at times, besides the deformities resulting from the difficulty in breathing and the signs of vascular compression, a condition which results directly from respiratory interference. Upon palpating the sternocostal region, one may ascertain a permanent asymmetrical arch down to the extremity of the manubrium of the sternum. Percussion reveals a zone of dullness at the two sternoclavicular articulations and at the upper part of the sternum. Percussion ought to be practised in a very gentle manner, if one wishes to note the shading in the fullness of the sound. It goes without saying that there should be an examination of the larynx and of the trachea when one suspects a hypertrophy of the thymus, the laryngoscope being the instrument used. As to tracheoscopy, the employment of which at present is rather limited, this method reveals in certain cases a depression of the trachea throughout many centimetres of its retrosternal portion. Another method of exploration, which should be more and more insisted upon on account of the important information which it gives, is radioscopy. This method may show an abnormal enlargement of the median shadow of the thorax, the shadow which is known as the thymic. In the cases in which hypertrophy of the thymus is distinct, the thymic shadow is very apparent

in the radiographic picture. Its position in the picture is in the median line, but it extends a little more to the left than to the right. It surmounts the cardiac shadow and is so closely connected with the latter that sometimes it is difficult to differentiate the contours which belong to one or the other. The thymic shadow has contours which are always clearly outlined, sometimes rectilinear, more often slightly curved; this shadow assumes the form of a trapezium or a quadrilateral with parallel sides, of which the angles are obtuse, the sides being sometimes scalloped, which is attributable to the lobulation of the gland. The thymic shadow is of equal density throughout its surface; it is compact, and of the same density as the cardiac shadow.

Such are the physical signs which permit the diagnosis of the existence of a hypertrophy of the thymus. None of these signs has an absolute value if isolated, but taken together they are of an undeniable importance, if their character, the mode of grouping or the intensity of the symptoms are studied.

A certain number of clinical manifestations of thymic hypertrophy have been described. These have been classified by M. d'Oelsnitz. In certain cases the sudden death may occur during sleep while the child is enjoying the best of health, or from no unusual cause, such as examination of the throat, a bath, or in the course of anesthesia; in the latter instance, death follows sometimes some minutes after the child falls asleep.

There are also the latent forms which manifest themselves suddenly by the appearance of accidents, more or less grave, that may prove a menace to life. These are sometimes severe attacks of suffocation, with difficulty of breathing and cyanosis. If interference is not prompt, death will result. M. d'Oelsnitz also calls attention to the silent forms which, by being intermittent, cause respiratory accidents, more or less intense, in the first months of the child's life: crises of suffocation of variable length which occur unexpectedly. The examination of the throat, of the larynx, and of the lungs is negative, but there exist a slight cyanosis of the face with dilatation of the superficial veins of the neck, sternocostal dullness, and an abnormal radiographic shadow.

The most usual forms are those in which the symptoms are constant with intermittent exacerbations; these, moreover, are the most favorable cases for observation of the physical signs and also for the useful intervention of surgery.

M. Marfan has described a cyanotic form of hypertrophy of the thymus.

Finally, there exist the forms of thymic hypertrophy associated with other affections, such as congenital wheezing, stridulous laryngitis, and spasm of the glottis.

By a critical study of the comparative value of all these symptoms, of which none is pathognomonic, the clinician is assisted in the diagnosis of hypertrophy of the thymus. All the symptoms, it may be stated, are inferential. Thus the symptoms of vascular compression indicate, purely and simply, a disturbance in the venous circulation, but without indicating the cause of the disturbance and this obtains in regard to other symptoms.

All the local signs of thymic hypertrophy are evidenced, whether the tumors are angiomatous, in the tuberculous ganglionic masses, or the truly sarcomatous sort that have pressed forward upon the manubrium of the sternum and the sternocostal articulations. The dullness, when

it occurs, cannot be differentiated from that which one finds in ganglionic hypertrophy, and ganglionic hypertrophy may co-exist with thymic hypertrophy.

In a large number of cases, the radioscopic examination is not faultless, since a defective technique or the lack of the proper immobilization of the child may enlarge or displace the shadow. Moreover, this shadow occurs in all retrosternal tumors, in goitres, in prevertebral abscesses, and finally, the thymic shadow may be confounded with the shadow of mediastinal adenopathy. But the ganglionic shadows are often not median. They are generally situated lower down, their contour is made up of a number of curved lines, and their density is unequal. They are accompanied by a trail of shadows or by isolated shadows at some distance.

All these points in regard to the difficulty in making a correct diagnosis should be remembered, since the symptoms of thymic hypertrophy do not yield the fullest knowledge; but by this it is not meant that their combined value should be belittled, for when taken together they are of great aid in making a correct diagnosis.

In conclusion, one can say with M. Ferrand that the clinical diagnosis of hypertrophy of the thymus is more often a diagnosis of probability than a diagnosis of certainty. Where there is a suspicion of the existence of this hypertrophy, all untoward symptoms should be carefully and systematically studied. Moreover, a thorough investigation should be made of all the symptoms in every case of laryngotracheal stenosis, and in vascular or nervous compression at the surface of the neck and at the upper part of the thorax, where these occur unexpectedly in the young child or in the nursling. By studying the comparative value of the signs and their manner of association, by eliminating successively all the affections which could be mistaken for thymic hypertrophy, the physician will be able to make a diagnosis, if not in all cases, at least in some, with a considerable degree of certainty. What should not be forgotten as the principal difficulty in achieving a correct diagnosis is the fact of the possible co-existence of other affections which present a symptomatology very similar to that of hypertrophy of the thymus. But this obstacle should not stand in the way of a thorough investigation of each and every case.

Despite the fact that a therapy has not as yet been devised for the cure of this ailment, despite the lack of scientific interest which attaches to this disease, the diagnosis in certain cases will at least be of prognostic value in cautioning the physician as to the real condition of the patient.

October 10th.

DIAGNOSTIC AND THERAPEUTIC NOTES.

Diazo-Reaction and Pulmonary Tuberculosis.—Weisz (*Muench. med. Wochenschr.*, 1911, No. 25). There is still much difference of opinion regarding the prognostic value of the diazo-reaction in pulmonary tuberculosis, a more or less sceptical attitude being rather prevalent. Weisz, however, is firmly convinced of its value especially in the modified form introduced by him. According to him, the substance which gives the positive diazo-reaction is a urochromogen, that is, a substance representing a lower stage of oxidation of urochrom, the normal yellow coloring matter of the urine. Weisz's test for urochromogen consists in diluting the urine three times with water and adding three drops of a one-tenth per cent. solution of potassium permanganate. The urochromogen is oxidized to urochrom and a yellow color results. This test may be substituted for Ehrlich's diazo-reaction and possesses certain advantages over the latter.

The cause of a positive urochromogen reaction, Weisz considers to be an inflammatory destruction of cellular tissue, and this, in pulmonary tuberculosis, means a progressive infection. Hence, a positive reaction in even a single specimen of urine is an unfavorable sign, and the more frequently or more constantly the reaction occurs the worse the prognosis. In general, too, it may he said that cases with a positive diazo- or urochromogen-reaction are unsuitable for tuberculin therapy and that, when in the course of a series of tuberculin injections a positive urochromogen reaction appears, the dosage of tuberculin is too high. The only method of treatment that promises results, in cases of positive diazo- or urochromogen-reaction, is the production of an artificial pneumothorax. Muralt, Brauer and Spengler have reported cases with positive diazo-reaction in which the improvement, following this method of treatment, was accompanied by a disappearance of the reaction.

On the Use of Increasing Doses of Arsenic.—Cloetta (*Korrespondenzbl. f. Schweiz. Aerzte,* 1911, No. 21). In the prolonged administration of arsenic it is customary slowly but steadily to increase the dose, so that finally the patient may be taking quantities which, if given at the beginning of the treatment, would have been strongly toxic. It has been assumed that a progressive immunity to arsenic occurred, the nature of which has always been obscure. Cloetta has shown, by means of a very interesting series of experiments on dogs, that this immunity is only apparent, not real. In one dog, which at first was very sensitive to arsenic, he was able, in the course of two years, to increase the tolerance to such a degree that 2.6 grm. of arsenious acid was taken daily without disturbance. It appeared, however, that this apparent tolerance was due entirely to a steadily increasing impermeability to arsenic of the gastro-intestinal mucous membrane. Indeed, while the large dose just mentioned

was administered, all but 0.13 per cent. of the arsenic passed through with the stool, so that the dog absorbed only a little over 3 mgrm. or gr. 1/20 daily. When this animal was given 1/60 of the daily dose hypodermically, he promptly died of acute arsenic poison.

Cloetta draws a number of interesting conclusions from his observations, not all of which can be detailed here. He finds evidence that arsenic is a most useful tonic, increasing the nitrogenous and fatty content of the individual cells. He states that the drug should always be given in solution and believes that where it fails to produce any effect, this may be due to a congenital or acquired impermeability of the intestinal wall to the drug. To such patients it should be given hypodermically.

Syphilitic Reinfection After Salvarsan.—Krefting (*Deutsch. med. Wochenschr.*, 1911, No. 31), Geyer (*Ibid.*, 1911, No. 33). When Ehrlich's salvarsan was first put upon the market, it was welcomed with enthusiasm. It was hoped that a remedy had been found, a single injection of which would completely cure every case of syphilis. This hope has proved fallacious, and salvarsan, while still considered valuable, is taking a place subordinate to the systematic use of mercury and iodides. In a certain small number of cases, however, Ehrlich's expectations are being fulfilled, and permanent cures are resulting from the use of salvarsan alone. These cures have been demonstrated in the only unmistakable manner, that is, by the occurrence of a fresh primary lesion, at a proper interval, after suspicious intercourse. In Krefting's case, a man with unmistakable syphilis had received three injections of salvarsan, with complete disappearance of the lesions and permanently negative Wassermann reaction. Some 19 weeks later, two new chancres appeared near the old scar, both rich in spirochætæ and with strongly positive Wassermann reaction.

In Geyer's case, the patient was cured by salvarsan after having infected his wife. Some time later he was reinfected by the latter, with the appearance of a typical primary lesion and a reappearance of the positive Wassermann reaction.

Human Hair as Suture Material.—Sofoteroff (*Zentralbl. f. Chir.*, 1911, No. 21). The writer advocates the use of woman's hair in vascular surgery, in which very fine, yet strong, thread is required. The hair is boiled in a solution of soda and is preserved in paraffine-vaseline. Hair so prepared was examined bacteriologically and found sterile.

The Intravenous Use of Bichloride.—Bacelli (*Il Policl.*, 1911, No. 13). Some years ago, Bacelli introduced into medicine the intravenous use of bichloride of mercury. In a recent communication he expresses himself enthusiastically regarding the value of this procedure, not only in syphilis, but also in a variety of other conditions, especially those not infrequent cases of septicemia in which the responsible micro-organism remains obscure. Even where the infection was so severe that the patient's condition seemed hopeless, Bacelli has obtained almost miraculous results. In every desperate infection, he maintains, these injections deserve a trial. He uses the following formula:—

Hydrargyri bichlorid.	0.01
Sod. chlorid.	0.075
Aq. sterilisat.	10.0

This amount is slowly injected into a vein. The temperature usually falls promptly and the patient's general condition improves. The same dose may be injected three times within twenty-four hours.

A New Test for Indican.—Barberio (*Il Policl.*, 1911, No. 17). The various tests for indican differ chiefly in the oxidizing agent used. Barberio advocates the use of sulphurous acid, in the form of sodium sulphite dissolved in distilled water in the proportion of 1 to 2,000. To 5 c.cm. of filtered wine, a few drops of this solution are added, the mixture shaken and then mixed with 5 c.cm. strong HCl and 2 c.cm. chloloform. The chloroform takes on a blue color whose intensity depends, in the absence of iodine, upon the amount of indican in the urine. If iodine is present, the addition of a crystal of sodium thiosulphate suffices to decolorize it.

A New Sign in Recurrent Appendicitis.—Wolkowitsch (*Zentralbl. f. Chir.*, 1911, No. 22). In a large number of cases of recurrent appendicitis, the writer has noted a phenomenon that appears to him to be of diagnostic value. In these cases, the broad muscles on the right side of the abdomen are in a condition of atony, sometimes verging upon atrophy. This atony can readily be perceived by palpation and can be quantitatively measured by means of the apparatus of Exner and Tandler.

Digitalis Gelatine.—Herz (*Muench. med. Wochenschr.*, 1911, No. 26). At a meeting of the Vienna Medical Society of May 26th, Herz made a provisional announcement of a new preparation of digitalis that bids fair to become of importance. The powdered, titrated digitalis leaves are macerated in water and then imbedded in gelatine. In this state, the leaves retain their original activity for a long time. The mass, which of course is fluid when warm, is cast into small bean-shaped portions, each of which contains 0.05 grm. pulv. fol. digit. These beans are then exposed to formaldehyde vapor which hardens their surface and renders them insoluble in the stomach contents. They thus pass the stomach unchanged, causing no gastric irritation and are slowly dissolved and absorbed in the intestine. Clinically, this form of digitalis medication has proved very satisfactory.

Two New Signs of Pleurisy.—Schepelmann (*Berl. klin. Wochenschr.*, 1911, No. 24), Sternberg (*Ibid.*). The former calls attention to the observation that in dry pleurisy the pain is increased when the patient bends his body towards the well side, whereas in intercostal neuralgia the pain is increased by bending the body towards the affected side. Sternberg considers a sensitiveness to palpation of the muscles of the shoulder girdle a valuable diagnostic sign in pleurisy. It increases or diminishes in intensity as the pleuritic inflammation grows worse or better. . .

BOOK REVIEWS.

ALLGEMEINE MIKROBIOLOGIE. Die Lehre vom Stoff-und Kraftwechsel der Kleinwesen. Füf Aerzte und Naturforscher dargestellt von Dr. med. Walther Kruse, O. Professor und Direcktor des Hygienischen Instituts an der Universitaet Koenigsberg in Preussen. Paper, 1184 pp. Leipzig: F. C. W. Vogel. 1910. Price, 22 m.

Kruse's "Allgemeine Mikrobiologie" presents a most careful study of this intricate subject; and even after a rather hasty perusal of this volume the reader can readily understand why it has taken the author the greater part of eight years to complete it. The book may be looked upon as the fourth edition of Fluegge's "Mikroörganismen," Kruse already having written the greater part of the third edition. Two future volumes will contain treatises on "Infection" and on "Immunity." The author presents the entire subject-matter from the point of view of the biologist and pathologist; the hygiene and the diagnostic and therapeutic application of the principles of microbiology are considered of minor importance in this volume. A full comprehension of pathological chemistry is the *sine qua non* of a correct conception of infectious diseases, and, to a large extent, of all physiological functions. While there are a number of good works accessible on physiological chemistry, viz.: Bunge, Hammarsten, Abderhalden, etc., detailed information on the various processes of decomposition of the carbohydrates and the various nitrogenous bodies, the action of ferments, the oxidizing and the reducing processes, the microörganismal poisons, etc., in a collective work, are obtainable only with difficulty by the average practitioner. Aside from Vaughan and Novy's, and the more modern Well's, treatises on pathological chemistry, the ready accessible literature is rather meagre.

Kruse's book furnishes a reliable fund of sound information enhanced by a good index and many valuable references. It is a work that cannot but prove of the greatest assistance to those students who have dabbled in this fascinating chapter in medical science; and even those who may think that their knowledge is complete will soon learn that from this monumental work may be drawn the complementary information which will round out what they had supposed was the necessary mastery of this subject.

SURGERY OF THE UPPER ABDOMEN. Surgical Diseases of the Stomach, Duodenum, Pancreas, Liver, its Ducts including Gall-Stones, their Diagnosis, Technique of Operations and After-Treatment. By John B. Deaver and Astley P. C. Ashhurst, M. D., Surgeon to the Out-Patient Department of the Episcopal Hospital. With many original illustrations. In two volumes. Vol. I.—The Stomach and Duodenum. With 76 illustrations, several of which are printed in colors. Philadelphia: P. Blakiston's Son and Co. Cloth, $5.00; Half Morocco, $6.50.

The plan of this book is well laid out, and includes a review of the opinion of the authorities in surgery upon the diseases of the upper abdomen as well as an expression of an opinion of the authors, whose experience, particularly that of the senior author, has been most extensive. In this first volume, the surgery of the stomach and duodenum is completed, and the treatment of the various sub-heads is thoroughly and most clearly dealt with. Appended to each subdivision is a list of all the references to that particular subject, which adds immensely to the value of the work. A large part of the book is devoted to the review of the operative measure employed in gastric and duodenal surgery. There are also an interesting discussion of the complications and sequelæ after operation, and a general consideration of the physiology, digestion, and the particular points of information as they apply to the stomach and duodenum. The second volume is not yet complete, and will deal with Surgery of the Liver, Gall-Bladder, Pancreas, and Spleen.

DIE KLINIK DER TUBERKULOSE. Handbuch der gesammten Tuberkulose fuer Aerzte und Studierende. Von Dr. B. Bandelier und Dr. O. Roepke. Wuerzburg: Curt Kabitzsch. 1911. Price, m. 9.50.

The above work is a product of many years of the author's personal experience with tuberculin in diagnosis and treatment. It has been written for practitioners and is designed to afford in a clear and simple way what is essential in order to obtain the successful results with tuberculin and, what is more important, the avoidance of its harmful effects. It deals with all the preparations and methods, with the exception of such as are of ephemeral interests, known to exert a specific reaction on tuberculous diseases. It considers in special detail those remedies which have already proved themselves of much service, giving their mode of action, application, indication, and counter-indications. Besides considering the specific reactions and treatment of those in general, it summarizes other perparations concerned in the production of active or passive immunity to tuberculosis with special mention of their application to local tuberculous lesions. The clearness of description of these products and of their application should create a wide circulation for this book among those who are not particularly acquainted with specific methods of diagnosis and treatment of this disease. Considered in the light of recent advances, particularly with regard to the diagnostic value of local tuberculin reactions, this book could not be considered authoritative. It is, however, to be regarded, on account of its general character and the wide scope which it covers in so small a space, as one worthy of careful study.

THE GOULSTONIAN LECTURES ON THE SENSIBILITY OF THE ALIMENTARY CANAL. Delivered at the Royal College of Physicians on March 14, 16 and 21, 1911. By Arthur F. Hertz, M. A., M. D. (Oxon.), F. R. C. P., Assistant Physician and Physician in Charge of the Department for Nervous Diseases, Guy's Hospital. New York and London: Oxford University Press. 1911.

This is an important piece of work. The sensibility of various portions of the digestive tract to different stimuli was carefully tested, the upper and lower portions on normal individuals, the gastric and intestinal mucosa in patients in whom artificial openings have been made for one reason or another. Among other interesting conclusions, the writer found that tactile sensation is limited to pharynx and anus, while heat and cold can also be felt in the esophagus—not in the stomach. Acids are felt nowhere; alcohol everywhere produces a sensation of warmth. The surface of gastric and intestinal ulcers is no more sensitive to tactile, thermal and chemical stimulation than the intact mucous membrane. The sensation of fullness in the alimentary canal is due to a slow increase in the tension exerted on the fibres of its muscular coat. The only immediate cause of true visceral pain is tension exerted on the muscular coat of hollow organs, and on the fibrous capsule of solid organs.

The experiments upon which these and other conclusions are based are of much interest. The book, which is short and can easily be read in an hour, will well repay perusal.

A MANUAL OF CLINICAL DIAGNOSIS. By Means of Laboratory Methods for Students, Hospital Physicians, and Practitioners. By Charles E. Simon, B. A., M. D., Professor of Clinical Pathology and Experimental Medicine at the College of Physicians and Surgeons; Pathologist to the Union Protestant Infirmary and the Hospital for the Women of Maryland; Clinical Pathologist to the Mercy Hospital of Baltimore, Maryland. Seventh Edition, Enlarged and Thoroughly Revised. Illustrated with 168 Engravings and 25 Plates. Philadelphia: Lea and Febiger. 1911. Price, $5.00.

The present edition of Simon's "Clinical Diagnosis" contains an interesting novelty. The book is divided into two parts. Of these, the first represents the technical portion and is not unlike the preceding edition, with the addition of new material and the exclusion of other matter that has become superfluous. Part II, which is altogether new, is a series of clinical pictures from the laboratory point of view. Under the heading of the various diseases, arranged in alphabetical form, the laboratory findings are described concisely but completely, thus supplementing usefully the more detailed discussion of the first part. The book should prove equally useful to student and practitioner.

HANDBOOK OF TREATMENT FOR DISEASES OF THE EYE. By Curt Adam, Assistant Surgeon in the I. University Clinic for Diseases of the Eye, Berlin. With a Preface by Professor von Michel, Berlin. Translated from the Second German Edition (1910) by William George Sym, M. D., F. R. C. S., Ed., and E. M. Lithgow, M. B., F. R. C. S., Ed. With 36 illustrations. New York: Rebman Company. Price, $2.50.

As the title implies, this handbook of Dr. Adam's deals primarily with the treatment of eye diseases and injuries. A general knowledge of the diagnosis of eye conditions is assumed. The author makes very plain the distinction between those eye diseases a general practitioner may treat with propriety and those which call for immediate reference to a specialist.

The first edition, which appeared in 1908, was rapidly exhausted and in 1909 a second edition, with additions bringing the therapeutics up to date, was prepared by the author.

It is this edition, ably done into English by Sym and Lithgow, that is under review. Dr. Adam appreciates the viewpoint of the general practitioner in relation to diseases of the eye, and well understands the sort of questions that are constantly arising in the latter's mind.

The book admirably fulfils the purpose for which it was intended.

MINOR AND OPERATIVE SURGERY INCLUDING BANDAGING. By Henry R. Wharton, M. D., Professor of Clinical Surgery in the Woman's Medical College of Pennsylvania; Surgeon to the Presbyterian Hospital, and the Children's Hospital, etc. Seventh Edition, enlarged and thoroughly revised, with 555 illustrations. Philadelphia: Lea & Febiger.

It is probably very hard for an author of a textbook that has gained favor and passed through several editions to make such changes as are consistent with the more modern times, and in this work this is the case. For instance, more space is given to the obsolete practice of wet cupping than is given to the modern procedure of direct transfusion of blood. For giving the student a fairly well-arranged scheme for studying surgical procedures, the book has some value, but as a guide to surgeons or practitioners its chief value will be found in the section on bandaging. As to important surgical operations the work is far from adequate. Minor surgery, however, is well handled, and properly speaking the book ought to be called "Minor Surgery and Bandaging."

MANUAL OF DISEASES OF THE EYE. For Students and General Practitioners. By Charles H. May, M. D., Chief of Clinic and Instructor in Ophthalmology, College of Physicians and Surgeons, Medical Department Columbia University, etc. Seventh Edition, Revised. With 362 Original Illustrations including 22 plates, with 62 colored figures. New York: William Wood & Co. 1911. Price, $2.00.

Dr. May's well-known "Manual of Diseases of the Eye" now appears in its seventh edition. We are assured that the text has been carefully examined and numerous paragraphs added on such subjects as the trachoma bodies, Lagrange's operation for glaucoma, the use of salvarsan in syphilitic ocular affections, injections of tuberculin, and Kronlein's operation. A new chapter on the "Ocular Manifestations" in general diseases also appears in this edition. Further comment on this manual, so well and favorably known, would be superfluous.

EDUCATION AND PREVENTIVE MEDICINE. By Norman Edward Ditman, Ph. D., M. D. New York: The Columbia University Press. 1911. Price, 25c.

This moderate-sized pamphlet of some seventy pages should prove a mine of information for the social worker. The author takes up in succession each of the commoner diseases and describes the preventive measures that are applicable to them, and the results that have hitherto been obtained in this regard. Some of the statistical diagrams, with which the monograph is profusely illustrated, do not quite demonstrate what they are supposed to do, but that is characteristic of many collections of statistics. The author concludes by a plea for a School of Preventive Medicine, not only for physicians, but still more for legislators and social workers.

WHAT SHALL I EAT? A Manual of Rational Feeding. By Dr. F. X. Gouraud. Formerly Chief of the Laboratory of the Medical Faculty of Paris. With a Preface by Prof. Armand Gautier, of Paris. Only Authorized Translation into the English Language by Francis J. Rebman. New York: Rebman Company. 1911.

This is an eminently sane book. Each article of diet is discussed concisely but adequately, its advantages and disadvantages pointed out, the best modes of preparing is described, and its utility or, the reverse in various pathological conditions discussed. It will prove equally useful in the hands of physicians and laymen and should stimulate the desire for more accurate knowledge of the much-neglected field of dietetics. Among the most interesting chapters are those devoted to white bread, alcohol and vegetarianism. In discussing white bread the author acknowledges its nutritive value, but points out its inferiority in many respects to the coarser breads. As regards alcohol he is by no means a bigot, but while admitting the value of very small amounts, he shows how low is the threshold of toxicity. Strict vegetarianism he considers altogether inadvisable for general use, but admits its value in certain pathological conditions. The statement of the translator that "the book deserves a place on the five-foot shelf of every medical man" seems hardly exaggerated.

A TEXTBOOK OF MEDICAL DIAGNOSIS. By James M. Anders, M. D., Ph. D., LL. D., Professor of the Theory and Practice of Medicine and of Clinical Medicine, Medico-Chirurgical College of Philadelphia, etc., and L. Napoleon Boston, A. M., M. D., Adjunct Professor of Medicine, Medico-Chirurgical College; Physician to the Philadelphia General Hospital, etc. With 418 illustrations in the text and 25 plates, 17 of them in colors. Philadelphia and Boston: W. B. Saunders Company. 1911. Price, Cloth $6.00, Half Morocco $7.50.

Anders and Boston's textbook can be highly recommended for use by undergraduate students of medicine. Its style is clear and succint, its illustrations add greatly to the descriptions and the fundamentals of medicine are adequately presented. The trained physician will find it less useful. It contains chiefly what he already knows, and if he refers to it for a puzzling point in diagnosis or prognosis he is apt to be disappointed. Our meaning will be made clearer, when we point out that only a short paragraph is devoted to myxedema and that the discussion of hyperthyroidism is limited to the description of typical Graves' disease. *Ex pede Herculem.*

APPENDICITIS AND OTHER DISEASES OF THE VERMIFORM APPENDIX. By Howard A. Kelly, M. D. With 215 original illustrations in color and black, 3 lithographic plates. Philadelphia: J. B. Lippincott Company.

By eliminating certain portions of the first edition, Kelly has been able to make a much more interesting volume of the second edition, but it still is a ponderous work. It will remain the best reference-book that we have on appendicitis, although in this respect it is not quite so replete with facts and references as the first volume. The most attractive feature of the work is the illustrations, and were one to use only this feature as an atlas the information gained would be tremendous. It is hardly fair to say the illustrations make the book, but they do most thoroughly illustrate the text. It is hardly necessary to review the separate chapters of the work, inasmuch as there is nothing decidedly new introduced since the first edition; but the whole work is of the high character that has signalized all the publications from Kelly's coterie of collaborators.

DIAET UND KUECHE. Einfuehrung in die angewandte Ernæhrungs-Therapie. Von Dr. Wilhelm Sternberg, Spezialarzt fuer Ernæhrungs-Therapie in Berlin. Wuerzburg: Curt Kabitzsch. 1911. Price, 5 m.

This book is by the author of "Die Uebertreibungen der Abstinenz," which was reviewed in these columns some time ago, and covers about the same ground. From the title, the ingenuous reader might infer that it is something of a cookbook or at least a textbook of dietetics. As a matter of fact, the entire volume is a polemic directed against those writers who ignore or even dispute the author's hobby that palatability is an essential feature of any rational dietary. We may well agree wholly with him and yet feel that his thesis could be adequately set forth within the limits of a journal article. The entire absence of an index is unpardonable in a book of this sort.

OPERATIVE SURGERY, INCLUDING SURGICAL ANATOMY. By John J. McGrath, M. D., Professor of Surgical Anatomy and Operative Surgery at the New York Post-Graduate Medical School, Visiting Surgeon to the Harlem Hospital, etc. Royal Octavo. Nearly 650 pages. Over 300 illustrations, including many full-page plates in colors and half-tones. Philadelphia: F. A. Davis Company. Extra cloth, $5.00; half morocco, $6.50.

Textbooks revised or rewritten should, as a general rule, give us the best guide for students, and this third edition of McGrath's "Operative Surgery" has grown and met the demands for a textbook that combines surgical anatomy with operative surgery. There is a very practical discussion of all the best methods of dealing with surgical problems, and the anatomical descriptions are clear and complete, being free from purely technical considerations. In this edition particular care has been given to the section on abdominal surgery.

HOSPITAL MANAGEMENT. A Handbook for Hospital Trustees, Superintendents, Training-School Principals, Physicians, and all who are actively engaged in promoting hospital work. By Charlotte A. Aikens, Member of the American Hospital Association, etc. Illustrated. Philadelphia and London: W. B. Saunders Company. 1911. Price, $3.00.

As the title-page indicates, this volume is designed especially for the use of hospital superintendents, trustees, training-school principals, physicians who are interested in or connected with hospitals; for students of hospital economics, for practical workers who labor in the capacity of professionals or administrators in any part of the hospital field.

Numbers of the most eminent superintendents and residents of American hospitals have contributed chapters.

INTERNATIONAL CLINICS. A Quarterly of illustrated clinical lectures and especially prepared original articles on Treatment, Medicine, Surgery, Neurology, Pediatrics, Obstetrics, Gynecology, Orthopedics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene, and other topics of interest to students and practitioners. By leading members of the medical profession throughout the world. Volume II. Twenty-first Series, 1911. Philadelphia and London: J. B. Lippincott Co. 1911. Price, $2.00.

This volume in text and illustrations is a worthy successor to its predecessors. The great variety of the contributions, many of them by eminent hands, forbids a detailed review. The consistent subscriber to the series is sure of a steady supply of all that is best and most modern in the field of medical investigation.

BAKTERIOLOGISCHES TASCHENBUCH. Die wichtigsten technischen Vorschriften zur bakteriologischen Laboratoriumsarbeit. Von Dr. Rudolf Abel, Geheimem Ober-Medizinalrat in Berlin. Fuenfzehnte Auflage. Wuerzburg: Curt Kabitzsch. 1911. Price, 2 m.

The fact that Abel's "Taschenbuch" has reached its fifteenth edition within twenty-two years makes any detailed review unnecessary. We need only to say that, of all the handy books of reference on bacteriological technique for the general practitioner, it is far and away the best. It well deserves translation.

A CAREFUL STUDY AND PRESENTATION OF MALARIA AND ITS MANIFESTATIONS. With the Most Thorough and Exhaustive Methods of Treatment of any Work of Its Kind on the Subject. By J. H. McCurry, M. D. Memphis, Tenn.: Press of S. C. Toof & Co. 1910. Price, $1.00.

This is a presentation of malaria from the standpoint of the Southern doctor. It will appeal especially to readers of *The American Journal of Clinical Medicine*. One chapter is devoted to the eclectic treatment of malaria.

DAS GESCHLECHTSLEBEN DES MENSCHEN. Von Dr. Gerhard Hahn in Breslau. Mit 47 Textabbildungen und 3 farbigen Tafeln. Leipzig: Johann Ambrosius Barth. 1911.

This is a well-written and well-illustrated little volume which in a popular, scientific manner presents to the lay public the physiology and pathology of the sexual organs with special reference to the problem of sexual hygiene and prevention of sexual disease.